

CITY OF SAN ANTONIO

HANDBOOK FOR FLATWORK CONSTRUCTION

January 2002
Department of Public Works
Engineering Division



CITY OF SAN ANTONIO

P. O. BOX 839966
SAN ANTONIO TEXAS 78283-3966

To All Contractors:

The Department of Public Works, Engineering Division, has developed this "Handbook for Flatwork Construction" as a handy reference for the Contractor. Included in this handbook is a section describing the procedure for requesting an inspection, as well as reinspection procedures.

For those companies who do work in the Central Business District (Tri-Party Area), we have enclosed the policy and procedures for working downtown.

Most importantly, we have enclosed updated details for sidewalks, drive approaches and handicap ramps. The applicable specifications for this work are also provided.

We hope this handbook will provide you with the necessary information to ensure a quality product and reduce the need for costly reinspections.

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PROCEDURE FOR EXCAVATION

START OF WORK

- a) Contact Right of Way Management Division at 207-6949 to obtain a Utility Excavation Permit.
- b) Contact Traffic Division to arrange a site meeting between your barricade company and the Traffic Division Representative. For work in the Central Business District, call 207-7755. For all other areas, call 207-7761. If required, obtain a Use of Right of Way Permit.
- c) Contact Development Services Department at 207-2800 to request inspections for concrete pours.

EXCAVATION IN STREETS

- a) Angle iron restraints must be in place, as per detail, with a minimum ledge of six (6) inches, between the saw cut and the horizontal edge of the angle iron.
- b) All material under bricks (asphalt, black base, concrete, etc.) must be saw cut.
- c) All exposed concrete collars must be dyed to match the brick colors. Collars that were chipped or broken, must be replaced, patching is not allowed. City crews will repour any collars that may have been damaged after replacing the bricks.
- d) If you choose to replace any collars, or pour new ones, this must be done after the bricks are replaced.
- e) After replacing base material, it is the Contractor's responsibility to keep steel plates in place, anchored with asphalt, and barricades in place until the City crews can replace the pavers. The City maintenance crew will contact you, so that the steel plates may be removed.
- f) All bricks must be delivered to the Street Maintenance Division located at 6802 Culebra Road. Contact Jerry Retama at 680-3826.

EXCAVATION IN SIDEWALKS

- a) The same as for streets, except that 2"x4" wood shall be used in lieu of angle irons to restrain brick pavers.

BACKFILL PROCEDURES

- a) Controlled Low Strength Material (Flowable Fill) shall be in accordance with the specification listed in pages **B1** and **B2**.
- b) Flexible Base or Cement Stabilized Base - Material needs to have sufficient moisture to obtain 95% density in one (1) foot lifts.
- c) Black Base - Type A or B, Hot Mix / Hot Lay, or Hot Mix / Cold Lay, compacted in six (6) inch lifts.
- d) Excavated material - may be reused and placed in one (1) foot lifts, with sufficient moisture to obtain 90% density.

BASE REPLACEMENT

- a) Black Base - Type A or B, Hot Mix / Hot Lay, or Hot Mix / Cold Lay to be placed in 2 five (5) inch lifts, for a depth of not less than ten (10) inches minimum.
- b) The final lift of base will be string lined to assure control of elevations.

INSPECTIONS

- a) Throughout the various stages of construction, an inspector will be monitoring the daily progress. Should you be ready for an inspection, and you have not seen the inspector, it will be your responsibility to call Development Services Department at 207-2800 and request an inspection. Any work done under the items outlined above, without an inspection, will be subject to removal.

UTILITY EXCAVATION PERMIT

GENERAL

This section governs excavation practices in the public right of way within the city that is under the jurisdiction and control of the Department of Public Works or successor department (hereafter referred to as the Department of Public Works). This section outlines the procedures for obtaining permits for excavation, performing excavation, and restoration of the public right of way.

The office issuing the Utility Excavation Permit is the Right of Way Management Division of the Department of Public Works for the City of San Antonio.

Detailed descriptions of the policy, procedures, specifications and standard details are included as part of the section or referenced in this section. These guidelines serve as minimum standard for working in the public right of ways.

The following objectives must be adhered to as part of the requirements for working in the public right of way:

- a) Maximize protection to the public and the work force.
- b) Maintain the integrity of the facility already in place and other adjacent facilities.
- c) Provide the ability to meet unusual emergency requirements when necessary in construction of the project.
- d) Minimize the inconvenience to vehicular and pedestrian traffic as well as to the adjacent landowners.
- e) Reduce the variations from the standard of utility assignments.
- f) Minimize future maintenance costs to the City caused by the excavation.
- g) Minimize time of street closure and interruption of the normal flow of traffic.

OFFICE LOCATION AND WORKING HOURS

City of San Antonio Department of Public Works
Right of Way Management Division
5103 Old Hwy 90
San Antonio, TX 78227
(210) 207-6949

Monday through Friday
7:45 AM - 4:30 PM

DEFINITIONS

The terms, phrases, words, abbreviations, and their derivations shall have the same meanings herein. When not inconsistent with the context, words used in the present tense include the future; words in the plural number include the singular number; and words in the singular number include the plural. The word "shall" is always mandatory and not merely permissive.

- a) **BACKFILL** means excavation fill material that meets city specified quality requirements or the placement thereof.
- b) **FIVE-YEAR CIP** means street improvements projects included in a Capital Improvement Project by the City of San Antonio or Street Maintenance Program by the City of San Antonio.
- c) **HOLE** means excavation in the public right of way with the excavation having a length less than the width of the pavement.

- d) **TRENCH** means an excavation in the pavement with the excavation having a length equal to or greater than one half (1/2) the width of the pavement.
- e) **PCI** means Pavement Condition Index.

REGISTRATION

All right of way users must be registered with the Public Works Department. Registration shall be successfully performed on a one-time basis, prior to commencement of any work. Insurance, Performance/Assurance Bond and Sureties must be approved and on file with the City Clerk's Office, Public Works Department and Finance Department upon registration. A certification shall be provided to each applicant that successfully completes the registration process. Annual registration updates shall be performed on the anniversary of the initial registration certification. Refer to Chapter 29, Section 173 and 174 of the City Code.

QUALITY ASSURANCE

For projects that include conduits, duck banks or pipelines, have final design drawings sealed, signed and dated by the Professional Engineer responsible for development of the drawing.

PERMIT FOR EXCAVATION IN THE PUBLIC RIGHT OF WAY

Before excavating in a right of way and except for emergency operations, a person or that person's agent shall obtain a permit under the Right of Way Management Division. A person who obtains a permit is not required to obtain a temporary Use of Right of Way Permit. The expiration date shall be included in the permit. Except as provided by Chapter 29, Section 134 of the City Code, the permit term must comply with the time period required by the Utility Excavation Criteria Manual for excavation and/or blocking or closing the right of way. The Director of Public Works may issue an extension of the permit upon request. Permits shall be issued for CONTIGUOUS projects not to exceed the following spatial limits:

- a) One Street segment (block) in length or less;
- b) A string of Street segments (blocks) where the PCI's are equal to each other, when the project extends more than one (1) Street block;
- c) One paved Alley segment (block) in length;
- d) A string of Alley segments (blocks) where the PCI's are equal to each other, when the project extends more than one (1) Alley block;
- e) Point Source exploratory excavations (Pot-holes) shall be permitted individually;
- f) Capital Improvement Projects may be submitted with multiple locations on a single application, but will be segregated and issued separate permits based on the paved block (Street or Alley) PCI relative to scheduled dates;
- g) Non -Contiguous areas of work shall be permitted individually. This provision includes excavation and traffic control efforts (Street lane, Sidewalk, and driveway closures with or without excavation involved), excavation in the parkway (including but not limited to non-conformance of alignment of power poles as outlined in Chapter 3 of the Utility Excavation Criteria Manual, bore-pits and pot-holes), unpaved Alleys and Drainage Right of Ways.

EMERGENCY WORK

A person performing an emergency excavation must comply with the procedures prescribed in Chapter 29, Section 131 of the City Code and the Utility Excavation Criteria Manual.

PROCEDURE FOR REQUESTING AN EXCAVATION PERMIT

The applicant may submit a request for a permit in person at the Right of Way Management Division office location during normal working hours or electronically if the applicant has an established electronic account with the Director or that person's designee.

An applicant must include:

- a) The name, address, telephone number, and fax number, if any, of the applicant or applicant's agent;
- b) An emergency telephone number at which the applicant or person who intends to excavate may be contacted on a 24 hour basis;
- c) The proposed beginning and ending dates of the excavation;
- d) A schedule for restoration of the excavated portion of the right of way;
- e) The proposed area of excavation, method of excavation, and location, including street address, cross streets, or other applicable description of the excavation location;
- f) Proof of insurance and Performance/Assurance Bond as required by Chapter 29, Sections 173 and 174 of the City Code;
- g) Proof that the owner has a franchise, consent, license, or other legal right to install facilities in a right of way, if the proposed activity involves installation of a facility;
- h) Proof that the applicant is registered under Chapter 29, Section 113 of the City Code, if applicable;
- i) A statement that the applicant has complied with applicable state and federal laws and regulations; and
- j) Any other information required by the Director to evaluate and process the application.

In reviewing an application for a permit, the Director shall consider the following:

- a) The size of surface and subsurface area to be affected, considering the type of excavation the applicant proposes;
- b) The period of time the applicant proposes to occupy the area;
- c) The safety of the pedestrian and vehicular traffic in and adjacent to the occupied area; and
- d) The vehicular and pedestrian traffic congestion and the vehicular parking requirements at the location.

DENIAL OF EXCAVATION PERMIT

A Utility Excavation Permit can be denied or suspended for any of the reasons outlined in Section 29-124 of the City Code of the City of San Antonio.

REVOCATION OF EXCAVATION PERMIT

The Director may suspend or revoke a permit if the permit holder fails to correct any violation or the Director determines that the violation creates an imminent danger to health or safety.

PAVEMENT DEGRADATION RECOVERY FEE

Except as otherwise provided by law, the Director may place additional conditions on a permit, including charging a Pavement Degradation Fee, as outlined in the City Code of the City of San Antonio. Except as otherwise provided by law, an applicant for a permit shall pay the permit fee and street damage restoration fee prescribed by separate ordinance.

Upon initial failure of the permitted site's Area of Influence, said permit holder shall pay a Pavement Degradation Recovery Fee. The Pavement Degradation Recovery Fee shall be determined as outlined in Chapter 29, Section 168 (E) of the City Code. The Pavement Degradation Recovery Fee shall not be applied to streets scheduled for restoration or streets with a PCI of less than 50, at the time of permit issuance.

OTHER APPLICABLE COSTS

The Right of Way User is responsible for cleaning up the area on or around the utility cut upon completion of work. In the event it is necessary for the City to clean up any area as a result of a Right of Way User's action, lack of action in a timely manner or negligence, the cost for this work will be billed to the Right of Way User at cost plus 10% Administrative Fee. This cost shall include, but not be limited to, labor (including overtime), equipment, fuel, material, supplies, and contractual services necessary to complete the work.

INSPECTION REQUEST

When requesting an inspection for sidewalks, driveways and curbs, the Right of Way User should call Development Services Department at 207-2800. The Right of Way User will be given a reference number pertaining to the request. The number is needed to find out if the inspection has been made. Each street will have its own number, and will change daily. Several addresses on the same street may have the same reference number. The Right of Way User still needs a permit. The inspector will notify the Construction Inspections' office that the inspection has been made. It will be the Right of Way User's responsibility to make the location for the Inspector's comments. If the inspection slip cannot be found, the Right of Way User needs to contact the Inspector.

Every effort will be made to make the inspection within 24 hours of the day it is requested. However, an inspection requested, as "ready now" after 2:30 p.m., may have to be conducted on the following day.

A failing inspection may require a 24-hour wait, until a second inspection can be made. If an inspection is requested at a location and is not ready, that counts as a failing inspection. Two failures for the same inspection will require an additional inspection fee. The Right of Way User must pay for the additional inspection and present a copy of the receipt to the Construction Inspections office before another inspection is requested.

A trench inspection must be scheduled with as much advance notice as possible. It is very helpful if the Right of Way User notifies Construction Inspections at what time the work will be ready for inspection. Should problems occur and the work will not be ready for inspection at that time, the Right of Way User must notify the Inspector immediately.

BRICK SURFACED STREETS

CENTRAL BUSINESS DISTRICT (TRI-PARTY AREA)

A utility owning a facility within a brick surfaced street (Tri-Party Area) should first determine that it is essential to disturb such surface. A thorough evaluation should be made to utilize other procedures to avoid the removal of bricks. The removal and replacement of bricks requires a unique and skilled treatment.

If a brick surfaced street must be cut, then the trenching procedure must be performed accordingly:

1. The bricks must be removed individually by hand and salvaged for reuse. The Contractor shall remove the bricks in a careful manner to insure the bricks are not damaged. Removal of bricks by equipment will not be permitted. The bricks must be delivered to the Department of Public Works, Street Maintenance Division, Northwest Service Center, located at 6802 Culebra Rd. 680-3607 or 680-3826.
2. The exposed outline of bricks, which are the outside boundaries for the trench, must be held in its position by restrainers. The number and length of restrainers will depend on the bricks that are not locked in place. See [Drawing C1](#).
3. The brick surfaced streets are supported by asphalt stabilized base. This base must be cut by a rock or concrete saw to the bottom of the base or to the top of the subgrade.
4. Equipment to excavate the trench must be equipped with rubber tires. When excavating with a backhoe, rubber or wood must be placed on the bricks to support the bucket and the stabilizers.
5. The Contractor must restore the trench up to but excluding the brick pavers. Public Works Department will replace the pavers. (See typical section for restoring trench.) If immediate traffic is necessary onto the trench, then the Contractor may place Hot Mix / Cold Laid Type "D" Asphalt in place of the bricks for the riding surface. When notified by the Contractor, Public Works Department will remove the asphalt and replace the brick pavers.
6. The cost of barricades is the responsibility of the Contractor from the beginning phase to Public Works completion of replacing the brick pavers.

All cost incurred by Public Works Department in the restitution of the trench will charged back to the permitted Contractor.

OTHER AREAS

Some pavers/bricks have been installed on a sand or fine granular aggregate cushion while others may have been adhered to the base with mortar, epoxy, etc. The following procedure will apply if a street, median or sidewalk with exposed paving blocks or brick is excavated:

1. Supported on a Sand or Fine Granular Aggregate Cushion. The pavers/bricks, which form the boundaries to the exposed excavation, must be held in its position by restrainers in accordance with this procedure and [Drawing C1](#). The number and length of restrainers will depend on the pavers/bricks that are not locked in place. The restrainers shall be removed upon replacement of the pavers/bricks.
2. Supported on other than on a Sand Cushion. [Drawing C1](#) shall be applicable except that the angle iron restrainers are not required.

3. The pavers/bricks shall be removed individually by hand and salvaged for reuse. The bricks shall be removed in a careful manner to insure that the pavers/bricks are not damaged. Removal of pavers/bricks by heavy equipment will not be permitted. The pavers/bricks shall be stored and reused in the cut area.
4. The Contractor will be responsible for all damage to the existing pavers/bricks. Any pavers/bricks that are damaged and/or broken by the Contractor shall be replaced at the Contractor's expense with similar material approved by the Street Maintenance Division of the Department of Public Works.
5. Any base material (flexible, asphalt, or concrete) under the pavers/bricks shall be saw cut half way through and removed to the top of the subgrade.
6. Upon completion of the backfilling of the trench, the pavers/bricks shall be laid using the same procedure (sand or fine aggregate cushion or adhered to base) as for the original installation and as close to the original position, material and pattern as possible.
7. Pavers/bricks set in sand shall be set with a vibratory plate compactor. Fine mortar sand shall be vibrated into all joints.
8. All repaired surfaces shall be smooth and true to established line, grade and cross section of the surrounding surface. When tested with a ten (10) feet straight edge, any deviation in the repaired surface in excess of 1/8 inch shall be corrected.
9. All repairs to sidewalks, driveways, and curb and gutter shall be true to both horizontal and vertical alignment to provide a neat and uniform appearance. Deviations from this will be considered as unacceptable work. Replacement will be at the Contractor's entire cost.

All cost incurred by Public Works Department in the restitution of the trench will charged back to the permitted Contractor.

BACKFILL OF EXCAVATED AREA

GENERAL

Open trenches may be temporarily backfilled for the convenience of the Permit Holder or for public safety. However, at least one (1) hour prior to beginning permanent backfill operations, the Permit Holder must notify the Director's Dispatcher of the time the backfill will begin. The Permit Holder will the permit number and location of the street cut before calling the dispatcher to request an inspection. No backfill will be considered acceptable unless this call has been received and the inspector has an opportunity to inspect the backfill operation. Permit Holder may commence backfill operations one (1) hour after notifying the Director's Dispatcher. Backfill made prior to the scheduled one (1) hour notice will be deemed unacceptable.

All excess water and mud shall be removed from the trench prior to backfilling. Any backfill placed during a rainy period or at other times, where excess water cannot be prevented from entering the trench, will be considered temporary and shall be removed as soon as weather permits. All disturbed base material or any base that has been undermined shall be removed and discarded. The new flexible base shall be the depth of the existing base but in no case less than twelve inches (12") thick.

BACKFILL SUPPORTING INFRASTRUCTURE

Backfill shall start with bedding of granular material per utility requirements followed with selected materials from the excavation or borrow. Materials used in backfill shall be soil material that is free of any appreciable amount of gravel or rock larger than four inches (4") dimension.

Backfill, which will support any portion of any sidewalk, driveway or roadway, shall be placed in uniform layers no to exceed six inches (6") in depth (loose measurement). Each layer shall be compacted to not less than ninety-five percent (95%) of the density as determined in accordance with Test Methods TEX-113-E and TEX-114-E. Each layer of backfill material shall be at the moisture content required to obtain the specified density and shall be compacted to that density by approved mechanical means. The use of wheel compactors will only be allowed with prior authorization from the Director. When wheel compactors are used, backfill lifts may be increased to twelve inches (12") provided proper moisture content of the backfill material is maintained and the specified minimum density is achieved.

Testing may be required to validate that adequate compaction is being achieved. All testing will be at the expense of the Permit Holder. If the backfill does not meet the density requirements, the backfill will be considered unacceptable and shall be removed and replaced at the expense of the Permit Holder.

The use of flooding as a means of obtaining compaction of backfill shall not be allowed.

BACKFILL NOT SUPPORTING INFRASTRUCTURE

All exposed areas, which will not support any portion of a sidewalk, driveway or roadway, shall be restored to original condition or better prior to excavation.

SIDEWALK REQUIREMENTS

All sidewalk construction shall conform to the provisions of Chapter 35 of the City of San Antonio Unified Development Code (UDC), City of San Antonio Standard Specifications for Public Works Construction, and to the latest criteria of the Americans with Disabilities Act (ADA) and the ADA Accessibility Guidelines for Buildings and Facilities (ADAAG), Section A14, Public Rights of Way.

Any existing sidewalks shall be required to be upgraded or replaced to meet the UDC and/or ADA.

The minimum width of sidewalks adjoining a planting strip shall be four (4) feet. The minimum width of sidewalks adjoining the curb shall be six (6) feet for Collectors and Arterials and four (4) feet for Residential. Street trees may be located in the planting strip if trees are a minimum of three (3) feet from the curb.

The minimum width of sidewalks located within the boundaries of the Downtown District shall be not less than six (6) feet.

A drawing separate from the plat showing all proposed sidewalk size and location shall be submitted to the Department of Public Works before a letter of certification will be issued.

Changes in the sidewalk location for a maximum linear distance of two hundred (200) feet are permitted to be approved by the field inspector without amending the Street Plan or utility layout provided such plans are annotated with a note stating that intent. During the plat review process, reviewing agencies may designate areas where prior approval of the agency is necessary for any alteration to the sidewalk location. No other changes shall be allowed without the approval of all agencies that approved the original utility layout.

Sidewalks shall not be installed in such a manner that they conflict with or are obstructed by power lines, telephone poles, fire hydrants, traffic/Street signs, mail boxes, trees, buildings, barriers, light poles, or any other structure. The grades of sidewalks shall be such that changes of grades greater than ten percent (10%) are not encountered within blocks. When there is an existing or anticipated obstruction, it shall be relocated whenever possible. If the obstruction cannot be relocated, the sidewalk shall be installed around the object and shall provide the required sidewalk width. When utility layouts are required as part of a plat, the location and extent of sidewalks within the subdivision shall be shown on the utility layout and shall be subject to the approval of the Director of Public Works and the utility agencies.

Sidewalks shall be constructed so as to align vertically and horizontally with adjoining sidewalks.

Sidewalks on private Streets shall meet the same criteria as for public Streets. Sidewalks shall be included in the same lot as the private Streets or within an access easement designated on the plat if located on private lots. Deed restrictions shall be required to ensure that sidewalks remain unobstructed.

Replacement sidewalks shall be Class "A" Concrete, as described on page **B3**, Standard Specification 300, "Concrete (Natural Aggregate)", matching the existing thickness but shall have a minimum thickness of four (4) inches. The concrete shall be placed on two (2) inches of gravel, crushed rock or flexible base material, except that the width and location shall match the existing sidewalk. All sidewalk replacement shall be extended to the nearest expansion or dummy joint of the existing sidewalk. Expansion joint material, that is 1/2-inch in thickness and conforms with Standard Specification Item No. 304, shall be placed at a distance not to exceed forty eight (48) feet between joints and passing through the entire thickness of the concrete being placed. A minimum of two (2) round and smooth dowel bars 3/8 inches in diameter and eighteen (18) inches in length shall be spaced eighteen (18) inches apart at each expansion joint. Weakened plane joints shall be made 3/4-inch deep and placed at intervals equal to the sidewalk width. The edges of all joints shall have a 1/4-inch radius. The concrete shall receive a broom finish unless the surface is to match an existing exposed aggregate surface.

Reinforcement shall match the existing, but in no case shall it be less than one layer of 6" x 6" - W2.9 x W2.9 welded wire fabric or equivalent. It shall be supported such that it will be at the mid-depth of the slab. During the placement of concrete, care shall be taken that the reinforcement remains at this position by means of stays, precast blocks, ties, hangers, metal chairs or other approved supports. If the replacement sidewalk is matching an existing sidewalk at a weakened plane joint, then the reinforcement shall be lapped a minimum of six (6) inches. See Standard Specification 502, "Concrete Sidewalks and Driveways", on page **B15** for complete requirements.

Concrete for sidewalks shall be placed as soon as practical after the utility has been placed. Sides of sidewalks shall be backfilled immediately after the forms are removed.

When a sidewalk is being replaced within the radius of a curb return at an intersection, a sidewalk Wheelchair Ramp shall be installed. See pages **C5 to C14** for design details.

All variance requests shall be submitted to the Planning Commission.

CURB OR CURB AND GUTTER REQUIREMENTS

Replacement curb and gutter shall be Class "A" concrete, conforming to Standard Specification Item No. 300.1, with finish mortar to be applied within one (1) hour of placement of the concrete. The curb and gutter shall be placed on a minimum of two (2) inches of crusher screenings, gravel or crushed rock, which shall be spread, wetted and thoroughly tamped. It shall be formed with "mules" and "S" trowels. Expansion joints, 1/2-inch wide of expansion joint material, shall be placed at intervals not to exceed forty-eight (48) feet. Weakened plane joints shall be made 3/4-inch deep and placed at eight (8) feet intervals. The edges of all joints shall have a 1/4-inch radius. All replacement curb or curb and gutter shall be constructed to the nearest expansion or dummy joint of the existing curb and gutter. If removed to a weakened plane joint, two (2) - twenty-four (24) inch smooth dowels, 1/2-inch in diameter shall be inserted a minimum of twelve (12) inches into the existing curb. A minimum of one (1) inch gap shall be provided at the end of the drilled hole.

If the excavation occurs under the existing curb and gutter and undermines more than four (4) feet of curb line, the undermined curb and gutter shall be removed and replaced to the nearest joints on each side of the cut.

If the excavation occurs under machine laid curb (not an integral curb and gutter) and has no joints, the curb shall be removed two (2) feet back from the excavation wall on each side but no less than a total of eight (8) feet.

If the curb or curb and gutter is undermined less than four (4) feet, Class "G" concrete (Standard Specification 300.5) or Controlled Low Strength Material (CLSM) may be used as backfill and bedding under the curb.

The Class "G" concrete or CLSM shall be placed over the bedding material encasing the utility line and shall extend a minimum of six (6) inches in the back and in the front of the curb or curb and gutter and two (2) inches below the proposed pavement.

The placement of the concrete or CLSM shall insure that all undermined areas will rest on the concrete or CLSM free of voids. There shall be a minimum of twelve (12) inches of Class "G" concrete or CLSM under the bottom of the existing curb or curb and gutter.

All curb or curb and gutter with visible signs of damage or movement shall be removed and replaced. Concrete and CLSM used shall be in accordance with City of San Antonio Standard Specifications.

TRAFFIC CONTROL

SIGNS, BARRICADES AND WARNING DEVICES

The Right of Way User working in any public rights of way is responsible for the safe movement of traffic (pedestrian and/or vehicular) through the construction area. Right of Way User shall meet all the requirements for barricading and traffic control as specified in Texas Manual on Uniform Traffic Control Devices (TMUTCD).

Only those individuals who are qualified by means of adequate training in safe traffic control practices and have a basic understanding of the principles established by applicable standards and regulations, including those in TMUTCD, should place and maintain the traffic control devices in the construction area.

If the Right of Way User does not subcontract the barricading to a firm specializing in traffic control, then they must have a trained and qualified person(s) and must submit the qualifications and name(s) of employees to the Traffic Engineer for approval prior to the start of the work. They must also at this time submit for review a traffic control plan with all signs barricades conforming to the requirements of TMUTCD.

All barricades used by the Right of Way User shall be of the type, size and design specified by TMUTCD. If a firm specializing in traffic control does not supply traffic control devices, then the devices must be inspected and approved by the Traffic Engineer.

Flashing or steady burning amber lights as specified by the City of San Antonio Barricade and Construction Standard sheets (BC-89) and the TMUTCD are required on barricades.

All traffic control devices must display accurate information describing the exact road situation.

If the City Engineer finds non-compliance with the TMUTCD, he will notify the Right of Way User in writing of the violation. If the Right of Way User ignores the citation, the Traffic Engineer will call a firm specializing in traffic control and place the necessary devices as required. The City will pay the charges but the Right of Way User must reimburse the City for all expenses plus five hundred dollars (\$500) for non-compliance. Failure to clear all charges will be sufficient grounds for denying the subsequent street cut permits.

All traffic control devices must be removed immediately upon completion of the work.

Prior to start of excavation, construction or any work associated with a permitted project, the Right of Way User shall install, erect or mount the following signs:

- 1) 48" x 30" minimum, per TxDOT Standard Sign G20-6, Contractor's informational sign, containing the following:
 - a) Name of the Contractor
 - b) Contractor's emergency phone number(s)
 - c) Name of the Right of Way User
 - d) Estimated completion date

Other information could be provided on the sign that would provide the general public additional contractor related data. This sign shall be clearly displayed minimum one (1) per block. The sign shall be clearly displayed and maintained for the duration of the project.

- 2) 78" x 48" minimum, TxDOT Standard Sign G20-8, Right of Way User informational sign, containing the following:
- a) Name of the Right of Way User
 - b) Address of the Right of Way User
 - c) City
 - d) State
 - e) Right of Way User emergency phone number(s)
 - f) Estimated start and completion dates

Other information could be provided on the sign that would provide the general public additional project related data. This sign shall be clearly displayed minimum one (1) per project, located at the terminus end of the project. The sign shall be clearly displayed and maintained for the duration of the project.

TRAFFIC SIGNAL EQUIPMENT

Whenever any excavation is to be performed within five hundred (500) feet of a signalized intersection, approval from Traffic Operations (207-7765) must be obtained prior to the start of the work. The approval will be in the form of an agreement signed by the applicant and the Traffic Operation's representative on a form depicting the intersection layout and traffic control equipment (loops, stub-outs, pull boxes, conduits, etc.) that will be affected by the planned excavation.

The applicant must notify Traffic Operations no less than seventy-two (72) hours prior to the start of the work. The notification should include specific information pertaining to location, scope and duration of planned excavation.

Traffic Operations will subsequently determine if a joint meeting between the applicant and a Traffic Operation's representative is needed to be held at the job site, wherein the Traffic Operation's representative will locate the existing traffic control equipment which may be affected by the scope of the planned work. Traffic Operations will subsequently depict the located equipment on the back of a work order. Both parties must sign this work order.

Forty-eight (48) hours prior to start of work, the applicant must notify Traffic Operations to modify or adjust the programming parameters controlling the traffic signal operation if deemed necessary by Traffic Operations.

The applicant is responsible to repair or replace at their own expense and to the satisfaction of the Traffic Engineer, any damage to the traffic control equipment including, but not limited to, vehicle loops, loop home-runs, loop stub-outs, conduits, risers and cabinets. The Right of Way User must hire a firm specializing in the installation of traffic signal equipment and have the signal restored to its original operational function. All materials, labor and procedures shall conform to the specifications of the City's Traffic Engineering.

The applicant is responsible for all liability for personal injury and/or property damage which may be caused as a result of the incurred damages should the applicant fail to notify Traffic Operations prior to the start of work and request Traffic Operations to modify or adjust the programming parameters controlling the traffic signal operation if deemed necessary.

Should the proposed scope of work conflict with the existing traffic equipment (signals, signs, markings), the Right of Way User is responsible to identify and implement any and all temporary measures (outside the controller box) required to continue traffic control operations during construction in accordance with City's Traffic Engineering and MUTCD guidelines. These measures as well as the traffic management plan are to be approved by the City's Traffic Engineering Division.

If the Right of Way User ignores the restitution of the signal, then the Traffic Engineer will make the correction. The Right of Way User must reimburse the City of all costs incurred including ten percent (10%) Administrative

Fee plus five hundred dollars (\$500) penalty per day per occurrence for non-compliance. Failure to clear all charges will be sufficient grounds for denying the next requested permit.

✂

CONTROLLED LOW STRENGTH MATERIAL (Flowable Fill)

This specification identifies the basic requirements for furnishing, mixing and transporting Controlled Low Strength Material (Flowable Fill).

Flowable Fill is a low strength concrete material suitable as a backfill for utility trenches, abandoned pipes, manholes and valves. It is a heavy material and will exert a high fluid pressure against any forms, embankment or wall used to contain the Flowable Fill.

MATERIALS:

Materials shall conform to the following:

Cement	- ASTM C150	
Fly Ash	- ASTM C618, Class C or Class F	
Water	- ASTM C94	
Admixtures	- ASTM C260 and/or C494	
Fine Aggregates	- Natural or manufactured sand or combinations thereof, free from injurious amounts of salt, alkali, vegetable matter or other objectionable material. It is intended that the fine aggregate be fine enough to stay in suspension in the mortar to the extent required for proper flow. The fine aggregate shall conform to the following gradation:	
	Sieve Size	% Passing
	$\frac{3}{4}$ inch	100
	No. 200	0 - 10

If a flowable mixture cannot be produced, the sand may be rejected.

MIX DESIGN:

The 28 day unconfined compressive strength must be less than 1000 PSI, while three (3) day strength must exceed 25 PSI. The quantities of dry material per cubic yard are as follows:

	WITH FLY ASH	WITHOUT FLY ASH
Cement	50.0 lbs	141.0 lbs
Fly Ash	250.0 lbs	N/A
Water	60.0 gals	49.9 gals
Fine Aggregate	2910.0 lbs	2800.0 lbs

CONSISTENCY:

Consistency shall be tested by filling an open-ended three inch (3") diameter cylinder six inches (6") high to the top with flowable fill. The cylinder shall be immediately pulled straight up and the correct consistency of the flowable fill shall produce a minimum eight-inch (8") diameter circular-type spread with no segregation.

BATCH, MIXING AND TRANSPORTATION:

Materials are to be measured by weight and/or volumetric methods. The flowable fill may be mixed in a central concrete mixer, a ready mix truck, or by other acceptable methods. The flowable fill shall be transported to the point of placement in a revolving drum mixer or in an agitator unit.

PLACING:

For pipe trench backfill, provide bulkheads at units of fill placement sufficient to confine backfill. Bulkheads are to be structural.

COVERING:

CLSM may be covered when it adequately supports the weight of construction equipment no less than 24 hours after completion of placement.

ITEM 300**CONCRETE (NATURAL AGGREGATE)**

This item shall govern for the material used; for storing and handling of materials; and for proportioning, mixing and transportation of concrete for all concrete construction.

This specification does not cover the placement, consolidation, curing, or protection of the concrete.

MATERIAL:

The concrete shall be composed of Portland Cement, mineral filler, if necessary, natural aggregates (fine and coarse), and water, proportioned and mixed as hereinafter provided in these specifications. Concrete shall meet all the requirements as set forth in ASTM C-94.

CLASSIFICATIONS AND PROPORTIONS:

The minimum cement content, maximum allowable water content, and maximum slump of the various classes of concrete shall conform to Table 1.

MEASUREMENT:

The quantities of concrete of the various classifications which constitute the completed and accepted structure will be measured by the cubic yard [cubic meter] in place. Only accepted work will be included and the dimensions used will be those shown on the plans or ordered in writing by the Engineer. No deductions in measurement will be made for paneling less than 3 inches [76mm] in width by 1 inch [25mm] in depth, for chamfers less than 2 inches [51mm], or for embedded portions of structural steel members.

PAYMENT:

The concrete quantities, measured as provided above, will be paid for at the contract unit prices bid per cubic yard [cubic meter] for the various classifications of concrete shown, which prices shall be full compensation for furnishing, hauling, and mixing all concrete materials; placing, curing, and finishing all concrete; all grouting and pointing; furnishing and placing all drains and expansion joints, except as hereinafter provided; furnishing and placing metal flashing strips; and for all forms and falsework, labor, tools, equipment, and incidentals necessary to complete the work.

The above provisions for payment shall not be interpreted to provide payment for concrete in railings, piling, concrete culvert pipe precast prestressed concrete units, or other concrete items for which provision is otherwise made in the contract.

The above provisions for payment of drains and expansion joints shall not be interpreted to provide payment for cast iron or structural steel shapes used in drains; for structural steel, cast iron, or cast steel bearing plates; or for steel members used in the armoring roadway joints. Payment for these materials is provided for in Item 302, "Metal for Structures".

No direct measurement or payment will be made for Concrete Class "G", but shall be considered subsidiary to the particular items required by the plans and the contract.

BID ITEMS:

- Item 300.1: Concrete Class "A" -
per cubic yard [cubic meter].
- Item 300.2: Concrete Class "B" -
per cubic yard [cubic meter].
- Item 300.3: Concrete Class "C" -
per cubic yard [cubic meter]
- Item 300.4: Concrete Class "D" -
per cubic yard [cubic meter].

TABLE 1

Class	Minimum compressive strength @ 28 days psi [MPa]	Maximum water- cement ratio	Slump range inches [mm]	Minimum - maximum sacks cement per cubic yard [cubic meter]
A	3,000 [20]	7.0	2 - 5 [50 - 125]	5.0
B	2,500 [17]	8.0	2 - 5 [50 - 125]	4.5
C	2,000 [14]	9.0	1 - 4 [25 - 102]	4.0
D	1,000 [6]	11.0	1 - 4 [25 - 102]	2.0
G	(as specified on plans)	5.50	2 - 3 [50 - 80]	6.0 - 8.0

ITEM 301**REINFORCING STEEL**

This item shall provide for the furnishing and placing of bar reinforcing steel of the size and quantity designated for use in structures and other concrete items that require reinforcing steel as shown on the plans and in accordance with these specifications.

MATERIALS:

Reinforcing steel shall be grade 60 and all bar reinforcement shall be deformed, conforming to the requirements of Item 440, "Reinforcing Steel" of the Texas Department of Transportation Standard Specifications. Reinforcing steel bars produced outside of the United States are acceptable if such bar reinforcement conforms to the requirements of the ASTM Specifications for the various designations of bars.

BENDING, TOLERANCES AND STORAGE:

Bending, tolerances and storage of reinforcing steel shall conform to articles 440.3, "Bending", 440.4, "Tolerances", and 440.5, "Storage" in Item 440, "Reinforcing Steel" of the Texas Department of Transportation Standard Specifications.

SPLICES:

No splicing of bars, except when provided on the plans, will be permitted without approval of the Engineer.

PLACING REINFORCEMENT:

All steel reinforcing shall be accurately placed in the position shown on the plans and firmly held during the placing and setting of concrete. All reinforcement shall be free from dust, rust, mill scale, paint, oil, mortar or foreign material. Bars shall be tied at all intersections, except that where spacing of bars in each direction is less than 12 inches [305mm], only alternate intersections need be tied. Distances from forms shall be maintained by means of stays, precast blocks, ties, hangers, metal chairs or other approved supports. Blocks for holding reinforcing bars from contact with the forms shall be precast concrete blocks of approved shape and dimensions or other equally suitable devices. The use of pebbles, pieces of broken stones or brick, metal pipe and wooden blocks shall not be permitted. Reinforcement in

any sections shall be placed and then inspected and approved by the Inspector before the placing of concrete begins.

MEASUREMENT:

The measurement of quantities of bar reinforcing furnished and placed, will be based on the calculated weight of the steel actually placed in accordance with the plans and these specifications, with no allowance made for added bar lengths for splices nor for extra steel used when bars larger than those specified are substituted with the permission of the Consulting Engineer. The wires and supporting devices will not be included in the calculated weights. The calculated weight of bar reinforcement will be determined using the theoretical bar weight set forth in Table 1 with no allowance for overruns or underruns.

PAYMENT:

Reinforcing steel measured as provided above, will be paid for at the contract unit price bid per pound [kilogram] of "Reinforcing Steel", which price shall be full compensation for furnishing, bending, fabricating, welding and placing reinforcement; for all clips, block, metal spacers, ties, wire or other materials used for fastening reinforcement in place; and for all tools, labor, equipment and incidentals necessary to complete the work.

Payment for reinforcing in items, which specifically include the cost of reinforcement, shall be paid for as provided in the specifications for those items.

BID ITEMS:

Item 301: Reinforcing Steel -
per pound [kilogram].

TABLE 1

Bar Size Number [mm]	Nominal diameter inches [mm]	Nominal Area square inch [mm ²]	Weight pound per foot [kg/m]
2 [6]	0.250 [6.35]	0.05 [32.26]	0.167 [0.249]
3 [10]	0.375 [9.525]	0.11 [70.97]	0.376 [0.560]
4 [12]	0.500 [12.7]	0.20 [129.03]	0.668 [0.994]
5 [15]	0.625 [15.875]	0.31 [200.00]	1.043 [1.552]
6 [20]	0.750 [19.05]	0.44 [283.87]	1.502 [2.235]
7 [22]	0.875 [22.225]	0.60 [387.10]	2.044 [3.042]
8 [25]	1.000 [25.4]	0.79 [509.68]	2.670 [3.973]
9 [28]	1.128 [28.651]	1.00 [645.16]	3.400 [5.060]
10 [30]	1.270 [32.258]	1.27 [819.35]	4.303 [6.404]
11 [35]	1.410 [35.814]	1.56 [1006.45]	5.313 [7.907]
14 [40]	1.693 [43.00]	2.25 [1451.61]	7.65 [11.384]
18 [55]	2.257 [57.328]	4.00 [2580.64]	13.60 [20.239]

ITEM 303



WELDED WIRE FLAT SHEETS

This item shall govern the furnishing of the various sizes of welded wire flat sheets as indicated on the plans or as directed by the Engineer.

MATERIAL:

All welded wire flat sheets used in construction shall conform to the requirements of ASTM A - 185. Welded wire rolls shall not be used.

CONSTRUCTION METHODS:

All splices between the welded wire flat sheets shall overlap sufficiently to allow the distance between the outer-most cross wires of each lapped fabric sheet to be no less than the spacing of the cross wires plus 2 inches [50mm].

Distances from forms or concrete surfaces shall be maintained by means of stays, precast blocks, ties, hangers, metal chairs or other approved supports. The

use of pebbles, pieces of broken stones or brick, metal pipe and wooden block shall not be permitted

At the edge of the construction, the wire fabric shall not be less than 1 inch [25mm] nor more than 3 inches [76mm] from the edge of the concrete and shall have no wires projecting beyond the last member parallel to the edge of the concrete.

MEASUREMENT AND PAYMENT:

No measurement or direct payment of welded wire flat sheets will be made for furnishing and placing of welded wire flat sheets. All materials and labor required will be considered subsidiary to the item in which it is used and shall be included in the unit price bid for said item.

ITEM 304**EXPANSION JOINT MATERIALS**

This item shall govern the furnishing and placing of all expansion joint material as herein specified in the various items of these specifications or as shown on the plans or as directed by the Engineer.

MATERIAL:

The material used for expansion joints shall conform to either of the following:

1. Preformed Bituminous Fiber Material shall be formed from cane or other suitable fibers of a cellular nature securely bound together and uniformly impregnated with a suitable asphaltic binder and shall meet the requirements of the Standard Specifications for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction, ASTM D-1751.
2. Boards for expansion joints shall be obtained from Redwood or Cypress timber and shall be sound heartwood, free from sapwood, knots, clustered Birdseye, checks and splits, occasional sound or hollow Birdseye, when not in clusters, will be

permitted provided the board is free from any other defects that will impair its usefulness as a joint filler.

CONSTRUCTION METHODS:

All materials use shall extend the full depth of the concrete and shall be perpendicular to the exposed face. All joints shall be shaped to conform to the contour of the finished section in which they are installed. All material shall be a minimum of ½ inch [13mm] thick.

MEASUREMENT AND PAYMENT:

No measurement or direct payment will be made for Expansion Joint Materials. All material supplied and installed as specified herein shall be considered subsidiary work to the various items of these specifications calling for Expansion Joint Materials.

ITEM 305**MEMBRANE CURING**

This item shall consist of curing by the impervious membrane method of all curbs, sidewalks, driveways, drive approaches, concrete rip rap, concrete structures and other concrete as specified in the various items of these specifications or as indicated on the plans.

MATERIALS:

The membrane curing compound shall comply with the "Standard Specification for Liquid Membrane-forming Compounds for Curing Concrete", ASTM C309, Type 1 clear or translucent without dye, Type 1 - D clear or translucent with fugitive dye, or Type 2 white pigmented. The vehicle shall be a Class A - no restriction on vehicle solids material, or Class B - vehicle solid restricted to all resin material. The material shall have a minimum flash point of 80° F [27° C] when tested by the "Pensky-Martin Closed Cup Method".

It shall be of such consistency that it can be satisfactorily applied as fine mist through an atomizing nozzle by means of approved pressure spraying equipment at atmospheric temperatures above 40° F [4° C].

It shall be of such a nature that it will not produce permanent discoloration of concrete surfaces nor react deleteriously with neither the concrete nor its components. Type 1 - D compound shall contain a fugitive dye that will be distinctly visible not less than 4 hours or more than 7 days after application. Type 2 compound shall not settle out excessively or cake in the container and shall be capable of being mixed to a uniform consistency by moderate stirring and shall exhibit a daylight reflectance of not less than 60 percent of that of magnesium oxide.

The compound shall produce a firm, continuous, uniform moisture impermeable film free from pinholes and shall adhere satisfactorily to the surfaces of damp concrete. It shall, when applied to the damp concrete surface, at the rate of coverage specified herein, dry to touch in not more than 4 hours and shall not be tacky or track off concrete after 12 hours. It shall adhere in a tenacious film and when sprayed, in a single application at the specified rate, on the vertical face of damp concrete, shall not run off or appreciably sag.

The compound shall not disintegrate, check, peel or crack during the required curing period. It shall not peel or pick up under traffic and shall disappear from the surface of the concrete by gradual disintegration.

The compound shall be delivered to the job only in the manufacturer's original sealed containers which shall be legibly marked with the name of the manufacturer, the trade name of the compound, the type of compound and class of vehicle, the nominal percentage of non-volatile material, and a batch number or symbol with which test samples may be correlated.

The permissible percentage moisture loss (at the rate of coverage specified herein) shall not exceed the following:

24 hrs. after application	2%
72 hrs. after application	4%

CONSTRUCTION METHODS:

Just before using the membrane-curing compound, it shall be thoroughly agitated in its original container until any settlement has been uniformly redispersed. Redispersion shall be checked with a 1 inch by 1 inch [25mm x 25mm] wooden slat or similar device scraped along the interior of the container and then examined for accumulation of settlement and uniformity of dispersion. The compound shall be maintained in a uniform condition, substantially free of settlement, during its use.

The compounds shall not be applied to a dry surface and if the surface of the concrete has become dry, it shall be thoroughly moistened by water fogging prior to application of membrane.

The membrane-curing compound shall be applied after the surface finishing has been completed, and immediately after the free surface moisture has disappeared. The surface shall be sealed with a single coat of the specified type of curing compound applied uniformly at the rate of coverage recommended by the manufacturer and directed by the Inspector, but not less than one (1) gallon per 180 square feet [1 liter per 5 square meters] of surface area. The curing compound shall not be thinned or diluted in any manner prior to application. The Contractor shall provide satisfactory means and facilities to properly control and check the rate of application of the compound.

At locations where the coating shows discontinuities, pinholes, or other defects, or if rain falls on the newly coated surface before the film has dried sufficiently to resist damage, an additional coat of the compound shall be applied immediately at the same rate of coverage specified herein.

To insure proper coverage, the Inspector will inspect all treated areas after application of the compound for the period of time designated in the governing specification for curing, either for membrane curing or for other methods. Dry areas are identifiable because of the lighter color of dry concrete as compared to dampened concrete. All suspected areas shall be tested by placing a few drops of water on the suspected areas. If the water stands in round beads or small pools, which can be blown along the surface of the concrete without wetting the surface, the water impervious film is present. If the water wets the surface of the concrete as determined by obvious darkening of the surface or by visible soaking into the surface, no water impervious film is present. Should the foregoing test indicate that any area during the curing period is not protected by the required water impervious film, an additional coat or coats of the compound shall be

applied immediately, and the rate of application of the membrane compound shall be increased until the areas are uniformly covered by the required water impervious film.

When temperatures are such as to warrant protection against freezing, curing by this method shall be supplemented with an approved insulating material capable of protecting the concrete for the specified curing period.

If at any time, there is reason to believe that the method of curing is unsatisfactory or is detrimental to the work, the Contractor, when notified, shall immediately cease the use of this method and shall change to curing by one of the other methods specified under this contract.

MEASUREMENT AND PAYMENT:

“Membrane Curing” as prescribed herein will not be measured or paid directly, but shall be included in the unit price bid for the items of construction in which membrane curing is applied.

ITEM 500



CONCRETE CURBING

This item shall govern for installation of Portland cement concrete curbing with or without reinforcing steel as required, construction on an approved subgrade or base in accordance with this specification and in conformity with the lines, grades, section and details shown on the plans, or as established by the Engineer.

MATERIALS:

1. Concrete: All concrete shall conform to the provisions of Item 300, "Concrete (Class A)" or shall be of the class as noted on the plans.
2. Reinforcing Steel: All reinforcing steel shall conform to the provisions of Item 301, "Reinforcing Steel".
3. Expansion Joint Materials: All expansion joint materials shall conform to the provisions of Item 304, "Expansion Joint Materials".
4. Membrane Curing Compound: All membrane curing compound shall conform to the provisions of Item 305, "Membrane Curing".

CONSTRUCTION METHODS:

Subgrade for curbing shall be excavated so as to have a cushion, a minimum of 2 inches [50mm] thick of crusher screenings, gravel or crushed rock, which shall be spread, wetted and thoroughly tamped. If dry, the cushion shall be sprinkled lightly before concrete is deposited thereon. Where the subgrade is rock, or gravel, 70% of which is rock, the 2 inch [50mm] cushion need not be used. The Inspector will determine if the subgrade meets the above requirement.

If the subgrade is undercut, or the natural ground is below "top of subgrade", the necessary backfill shall be made with an approved material and compacted with a mechanical tamper. Hand tamping will not be permitted.

Forms shall be of metal or well-seasoned wood. Forms shall be clean, straight and free from warp and of the depth required. All forms shall be securely staked to line and grade and maintained in a true position during the depositing of concrete. The inside forms shall be rigidly attached to the outside forms. Before concrete is placed, all forms shall be oiled with light form oil.

The reinforcing steel, if required, shall be placed in position as shown on the typical section. Care shall be exercised to keep all steel in its proper location.

Expansion joint material shall be provided at intervals not to exceed 48 feet [15m], and shall extend the full width and depth of the concrete. Templates for "dummy" joints shall be of steel, not less than 3/16 of an inch [5mm] in thickness and patterned to the shape of the curb. Templates shall be cleaned, oiled, and spaced to cut the curb in sections of 8 feet [2.5m] in length. The templates shall extend a distance of 8 inches [203mm] into the curb from the top down.

Two round smooth dowel bars 3/8 of an inch [10mm] in diameter and 18 inches [457mm] in length shall be installed at each expansion joint. One 9 inch [229mm] end of each dowel shall be thoroughly coated with hot oil asphalt so that it will not bond to the concrete; approved types of slip joints may be used in lieu of coating ends of dowels. The dowels shall be placed on the vertical centerline 3 inches [76mm] from the top and bottom.

Concrete shall be placed in the forms, rodded and tamped to exclude all air and honeycomb. After the concrete has become sufficiently set, the exposed edges shall be rounded by the use of an edging tool to the radii indicated on the plans. After the inside form has been removed, the surface shall be dusted with a dust consisting of one (1) part "Portland Cement" and two (2) parts fine sand. The entire exposed surface of the curb shall be floated to a uniform smooth surface then finished with a camel hairbrush or wood float to a gritty texture. It is not permissible to plaster curb where forms have stayed on over night. The forms must be removed and the curb finished monolithic the same day as concrete is poured. Immediately after finishing the curb, it shall be protected by a membrane compound-curing agent.

The curb shall be backfilled to the full height of the concrete, tamped and sloped as directed by the Inspector. The top 4 inches [102mm] of fill shall be of clean topsoil, free of stones and debris.

MEASUREMENT:

Accepted work as prescribed by this item will be measured by the linear foot [meter] of concrete curb, complete in place.

PAYMENT:

The work performed as prescribed by this item will be paid for at the contract unit price bid per linear foot [meter] for "Concrete Curbing", which price shall be full

compensation for preparing the subgrade, for furnishing and placing all materials, including reinforcing steel, all expansion joint material, curing and any other materials, manipulations, labor, tools, equipment and incidentals necessary to complete the work. Topsoil to be paid under Item 515, "Topsoil".

BID ITEM:

Item 500: Concrete Curbing - per linear foot [meter]

ITEM 501**MACHINE LAID CURB**

This item shall govern for installation of Portland Cement concrete curb, constructed on an approved base in accordance with this specification and in conformity with the lines, grades, sections and details shown on the plans or as established by the Engineer.

MATERIALS:

1. Concrete: All concrete shall conform to the provisions of Item 300, "Concrete (Class A)" or shall be of the class as noted on the plans.
2. Expansion Joint Materials: All expansion joint materials shall conform to the provisions of Item 304, "Expansion Joint Materials".
3. Membrane Curing Compound: All membrane curing compound shall conform to the provisions of Item 305, "Membrane Curing".

CONSTRUCTION METHODS:

The base required between the curbs shall be extended to a line designated on the typical sections and details.

The curb shall be laid by a curbing extrusion machine approved by the Engineer. The line for top of curb shall be maintained from a guide-line or guide-rails set by the Contractor from survey marks established by the Consultant. Curb outline shall strictly conform to the details shown on the plans. The forming tube of the extrusion machine shall be readily adjustable vertically during the forward motion of the machine, to provide required variable height of curb necessary to conform to the established grade line. If a guideline is used, a pointer or gauge shall be attached to the machine in such a manner that a comparison can be made between the curb and the guideline in order to provide a continual check on the curb grade. Other methods may be used if approved by the Engineer.

The concrete shall be fed into the machine in such a manner and at such consistency that the finished curb will present a well compacted mass with a surface free from voids and honeycomb and true to established shape, line and grade.

Immediately following extrusion, any voids between the trench walls and curb shall be filled with well compacted concrete and finished off flush with the surface of the base.

Any additional surface finishing specified and/or required shall be performed immediately after the above void-filling operation. "Dummy" joints shall be cut to a depth of 1/2-inch [13mm] at 8-foot [2.5m] intervals or as directed by the Inspector.

Whenever the curb end abuts a concrete structure, a 1/2-inch [13mm] pre-molded expansion joint, conforming to the curb section, shall be placed between the two concrete surfaces.

Whenever extrusion is suspended long enough to produce a cold joint, 3/8 inch [10mm] smooth dowel bars, 18 inches [457mm] long, shall be embedded 9 inches [229mm] into the completed curb, one-quarter (1/4) curb height from top and bottom. The end of the curb at the point of suspension of extrusion shall be cut back until all remaining concrete is of a dense well compacted nature.

Any addition of concrete to the extruded curb is to be applied and finished before the extruded curb has achieved its initial set.

When finishing operations are completed, the curb is to be coated with membrane curing compound.

When the curb has cured, it shall be backfilled to the full height of the concrete, tamped and sloped as directed by the Inspector. The top 4 inches [102mm] of fill shall be clean topsoil, free of stones and debris.

MEASUREMENT:

Machine Laid Curbs will be measured by the linear foot [meter] of completed and accepted curb, complete in place.

PAYMENT:

The work performed as prescribed by this item will be paid for at the contract unit price bid per linear foot [meter] for "Machine Laid Curb", which price shall be full compensation for furnishing and placing all materials, including dowel bars and expansion joints and for all other materials, manipulations, labor, tools, equipment and incidentals necessary to complete the

work. Topsoil, 4 inches [102mm] depth used as fill behind the curb will be paid under Item 515, "Topsoil".

BID ITEM:

Item 501: Machine Laid Curb - per linear foot [meter].

ITEM 502



CONCRETE SIDEWALKS AND DRIVEWAYS

This item shall govern for concrete sidewalks and driveways, composed of Portland Cement concrete, constructed as herein specified on an approved subgrade, in conformity to the lines, grades and details shown on the plans or as established by the Engineer.

MATERIALS:

1. Concrete: All concrete for sidewalks and driveways shall conform to the provisions of Item 300, "Concrete (Class A)".
2. Reinforcing Steel: All reinforcing steel shall conform to the provisions of Item 301, "Reinforcing Steel".
3. Welded Wire Flat Sheets: All welded wire fabric shall conform to the provisions of Item 303, "Welded Wire Flat Sheets".
4. Expansion Joint Materials: All expansion joint materials shall conform to the provisions of Item 304, "Expansion Joint Materials".
5. Membrane Curing Compound: All membrane curing compound shall conform to the provisions of Item 305, "Membrane Curing".
6. Exposed aggregate sidewalks: Natural aggregate: All natural aggregate (fine and coarse) shall be obtained from a "Medina River Source" or other similar source. These aggregates shall be of a tan to brown color so as to impart an "earth-tone" color. Samples of the aggregates shall be submitted prior to construction for approval by the City.

CONSTRUCTION METHODS:

The subgrade shall be excavated and shaped to the lines, grades and cross section shown on the plans or as directed by the Engineer, and shall be thoroughly compacted. A cushion, 2 inch [50mm] minimum thickness, of crusher screenings, gravel, crush rock or flex base material shall be spread, wetted thoroughly, tamped and leveled. The cushion shall be moist at the time the concrete is placed. If the subgrade is undercut, or the natural ground is below "top of subgrade" then necessary backfill shall be made with approved material and compacted with a mechanical tamper. Hand tamping will not be permitted.

Where the subgrade is rock or gravel, 70% of which is rock, the 2-inch [50mm] cushion need to be used. The Inspector will determine if the subgrade meets the above requirement. Forms shall be of metal or well-seasoned wood of a section satisfactory to the Inspector, clean, straight, free from warp, and of a depth equal to the thickness of the finished work. All forms shall be securely stacked to line and grade maintained in a true position during the depositing of concrete. Forms for curbs, sidewalks, and driveways shall be cut to grade. Grade nails or chalk lines will not be permitted. Before concrete is placed, forms shall be thoroughly oiled with a light form oil.

Expansion joint material, 1/2-inch thick [13mm], shall be provided at intervals not to exceed 48 feet [15m] and where the new construction abuts the existing curbs or driveways if the Inspector deems it necessary. The expansion joint material shall be placed vertically and shall extend the full depth and width of the concrete.

A minimum of two (2) round smooth dowel bars 3/8 inches [10mm] in diameter and 18 inches [457mm] in length shall be spaced 18 inches [457mm] apart at each expansion joint. Nine inches [229mm] of each dowel shall be thoroughly coated with hot oil asphalt or greased, so that it will not bond to the concrete. Approved types of slip joints may be used in lieu of coating ends of dowels.

Sidewalks shall be marked with transverse "dummy" joints as shown on details sheets, by the use of approved joining tools.

Concrete sidewalks and driveways shall be reinforced as shown on the plans. Reinforcement for sidewalks shall consist of either one (1) layer of 6"x6" - W2.9 x W2.9 welded wire flat sheets or No. 3 (3/8") [10mm] reinforcing steel, placed not more than 18 inches [457mm] on centers both directions. Reinforcement for driveways shall consist of either one (1) layer of 6"x6" W4.7 x W4.7 welded wire flat sheet or No. 3 (3/8") [10mm] reinforcing steel placed not more than 12 inches [305mm] on centers both directions. All reinforcements

shall be placed equidistant from the top and bottom of the concrete. Care shall be exercised to keep all steel in its proper position during the depositing of concrete. Splices in wire fabric shall conform to the requirements set forth in Item 303, "Welded Wire Flat Sheets". Splices in the No. 3 bars shall have a minimum lap of 12 inches [305mm].

Reinforcing for commercial driveways shall consist of either on (1) layer of 6"x6" – W7.5 x W7.5 welded wire flat sheets or No. 4 (1/2") [12mm] reinforcing steel placed not more than 12 inches [305mm] on centers both directions. The concrete slab shall be a minimum of 6 inches [152mm] thick or as shown on the plans.

Concrete shall be placed in the forms and spaded, tamped and thoroughly compacted until mortar entirely covers the surface and has a monolithic finish. The top surface shall be floated and troweled to a uniform smooth surface, then finished with a camel hairbrush or wood float to a gritty texture. The outer edges and joints shall be rounded with approved tools to the radii shown on the plans.

Finish for Exposed Aggregate Sidewalks: Wash concrete surface after initial set with staff bristle brush and water to remove matrix and clean each piece of exposed coarse aggregate. Unless otherwise acceptable to the Inspector, perform washing and brushing 3-4 hours after casting. Care shall be taken to uniformly expose about a third of each piece of coarse aggregate, removing no more of the matrix than necessary to achieve a uniform exposure of coarse aggregate across the panel surface and as required to achieve appearance similar to adjacent existing work. After seven days, follow with a final cleaning with a mild acid solution and a final rinsing with clear water.

Immediately after finishing, the surface shall be protected by a membrane-curing compound, or by wetted cotton or burlap mats. Either method shall be subject to approval

by the Inspector. All necessary excavation for the sidewalk section will be considered incidental work, pertaining to this item and will not be paid for directly. The adjacent excavation and grading of the slopes shall be done in a manner acceptable to the Inspector.

MEASUREMENT:

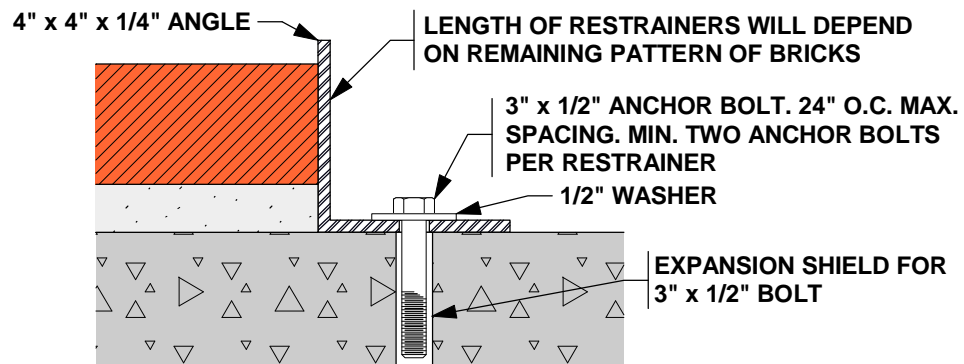
Accepted work performed as prescribed by this item will be measured by the square yard [square meter] of surface area of concrete.

PAYMENT:

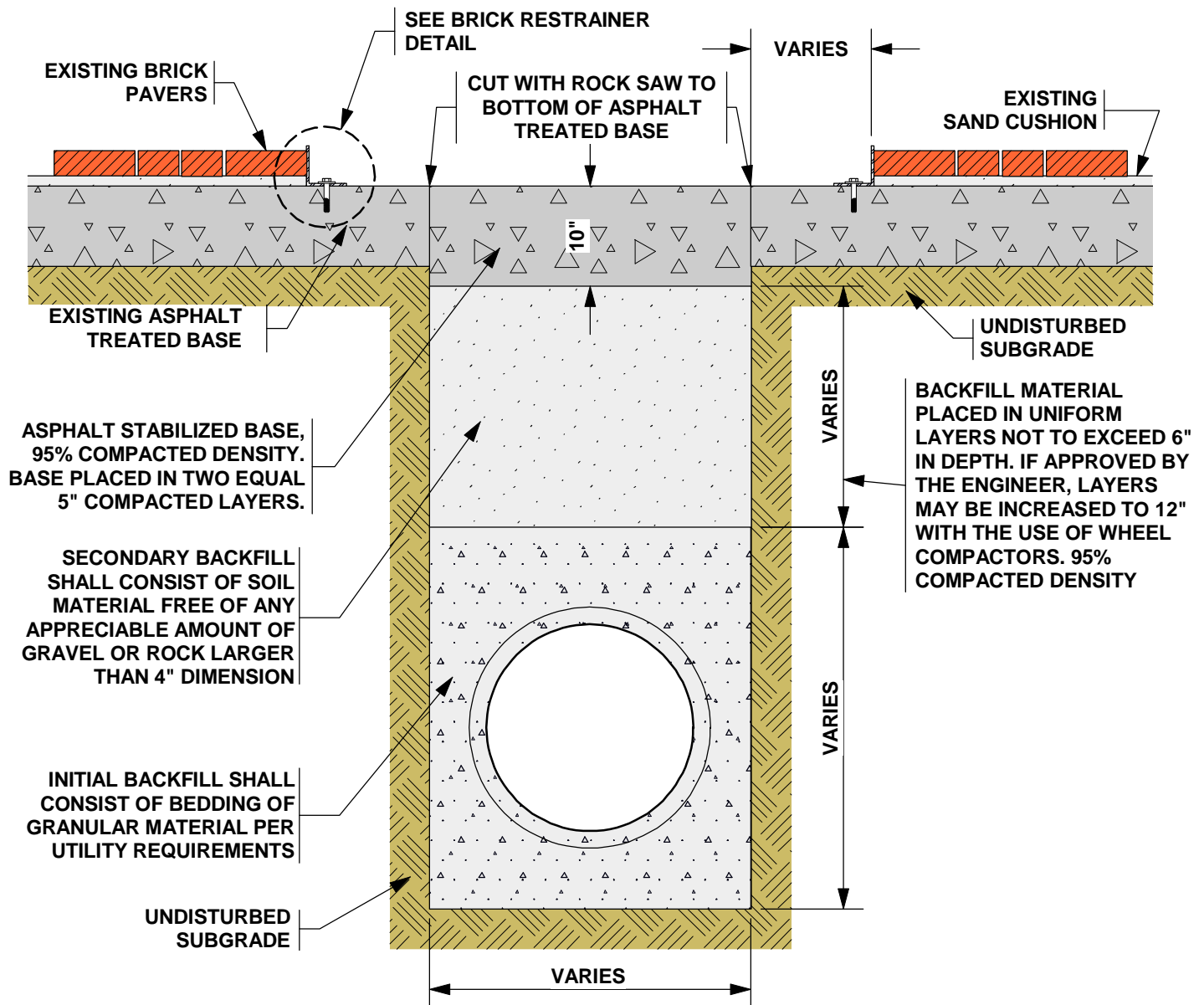
The work performed as prescribed by this item will be paid for at the contract unit price bid per square yard [square meter] for "Concrete Sidewalks", or "Concrete Driveways", which price shall be full compensation for preparing the subgrade; for furnishing and placing all materials, including all reinforcing steel and expansion joint material, and for any other materials, manipulation, labor, tools, equipment and incidentals necessary to complete the work. Filling and grading of the slopes, adjacent to the completed concrete sidewalks and/or driveways will be paid as subsidiary work under Item 104, "Excavation".

BID ITEMS:

- Item 502-1: Concrete Sidewalks -
per square yard [square meter].
- Item 502-2: Concrete Driveway -
per square yard [square meter].
- Item 502-3: Commercial Driveway -
per square yard [square meter]
- Item 502-4: Exposed Aggregate Sidewalk -
per square yard [square meter]

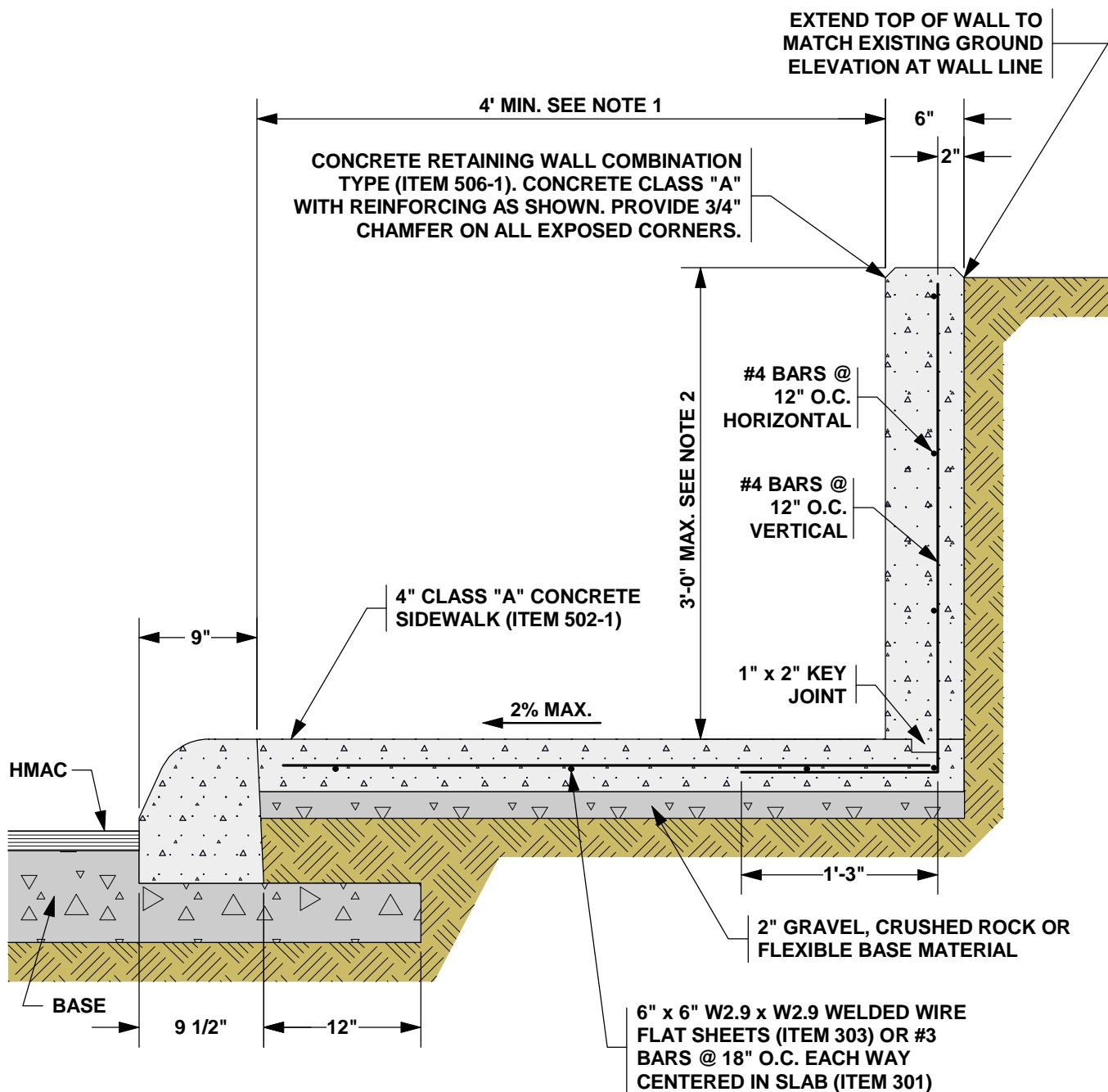
**BRICK RESTRAINER DETAIL**

SCALE: 3" = 1'

**BRICK SURFACED STREET SECTION**

SCALE: 3/4" = 1'

BRICK SURFACED STREET DETAIL



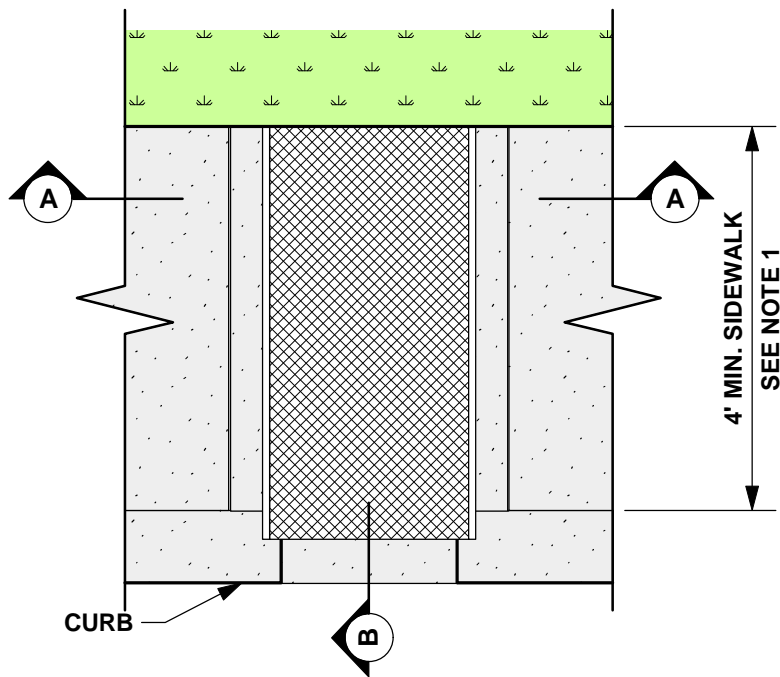
RETAINING WALL AND SIDEWALK SECTION

SCALE: 1" = 1'

NOTES

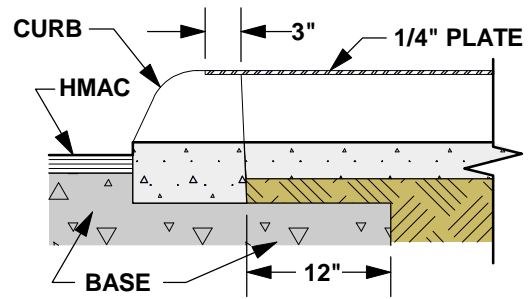
1. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
2. WALL HEIGHT TO BE SHOWN ON PLAN AT SPECIAL LOCATIONS WHERE COMBINATION RETAINING WALL IS REQUIRED. RETAINING WALLS GREATER THAN 3'-0" IN HEIGHT SHALL BE DESIGNED BY THE ENGINEER.

CONCRETE RETAINING WALL COMBINATION TYPE

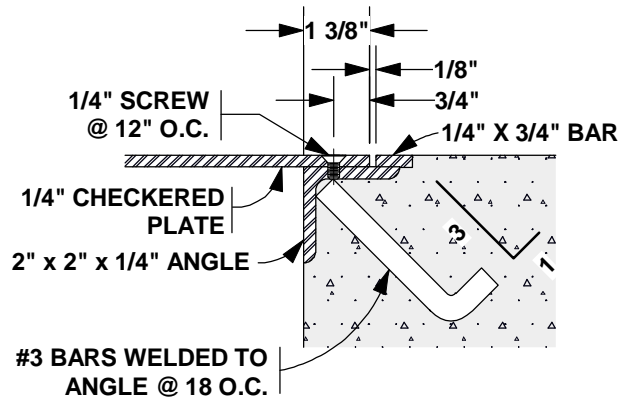
**SIDEWALK DRAIN**

SCALE: 1" = 2'

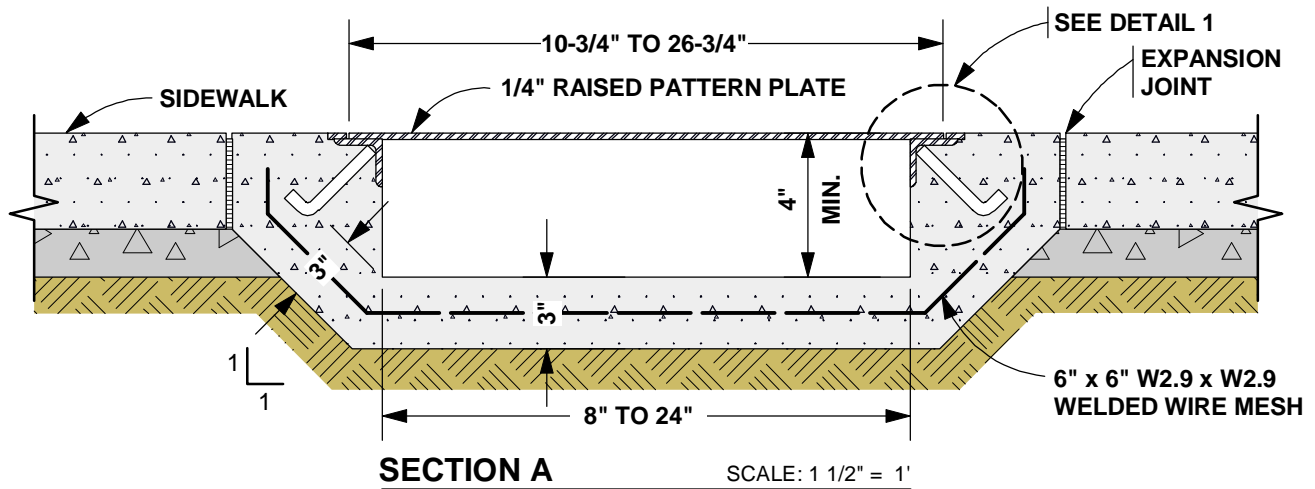
PLAN VIEW WITH SIDEWALK ABUTTING CURB

**SECTION B**

SCALE: 3/4" = 1'

**DETAIL 1**

SCALE: 3" = 1'

**SECTION A**

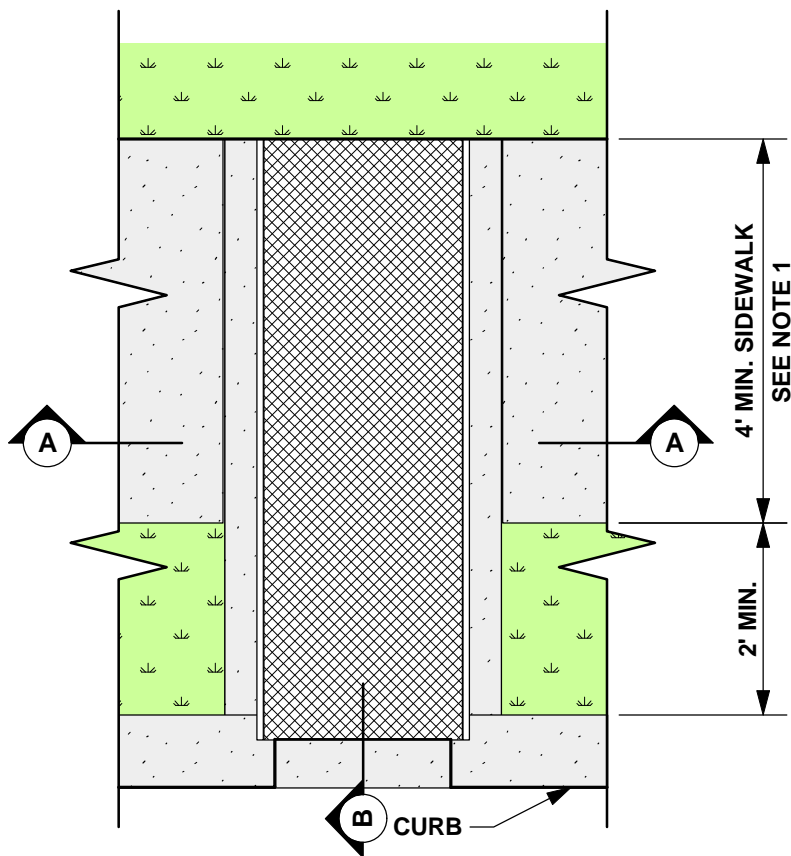
SCALE: 1 1/2" = 1'

NOTES

1. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.

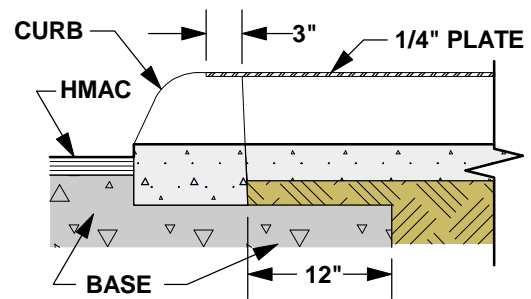
SIDEWALK DRAIN

WITH SIDEWALK ABUTTING CURB

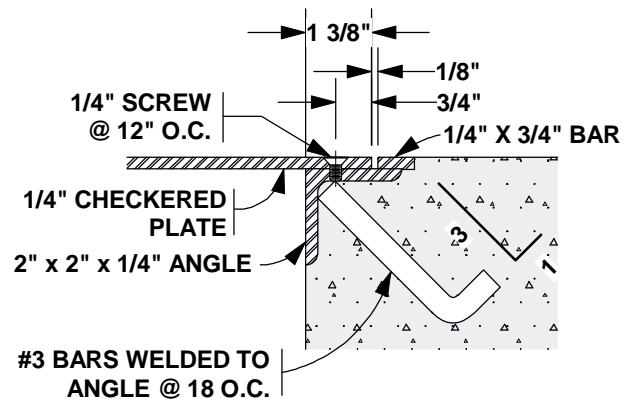
**SIDEWALK DRAIN**

SCALE: 1" = 2'

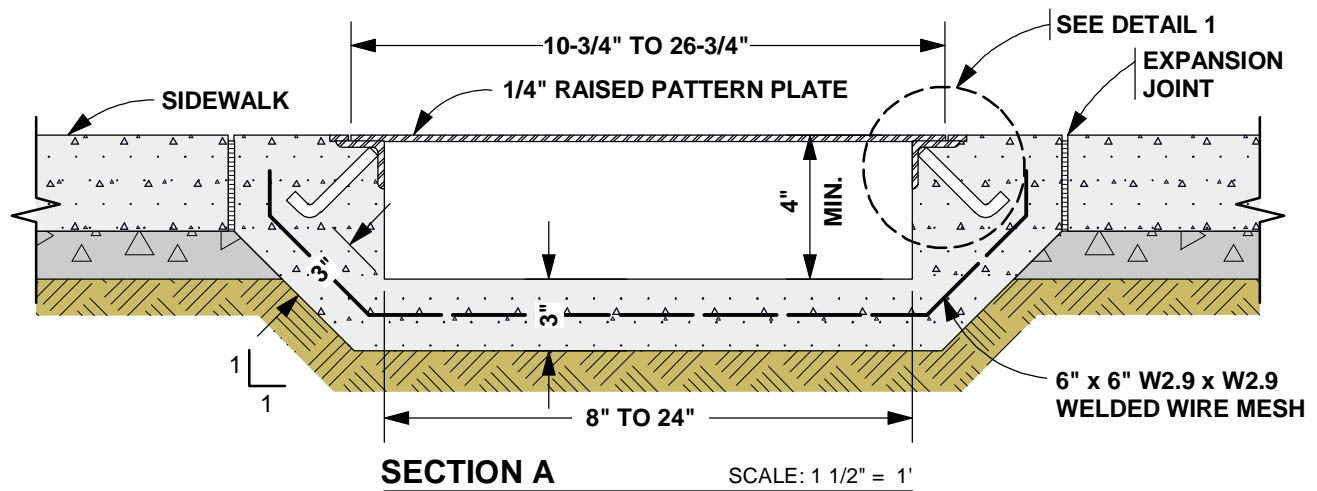
PLAN VIEW WITH SIDEWALK SEPARATED FROM CURB

**SECTION B**

SCALE: 3/4" = 1'

**DETAIL 1**

SCALE: 3" = 1'

**SECTION A**

SCALE: 1 1/2" = 1'

NOTES

1. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.

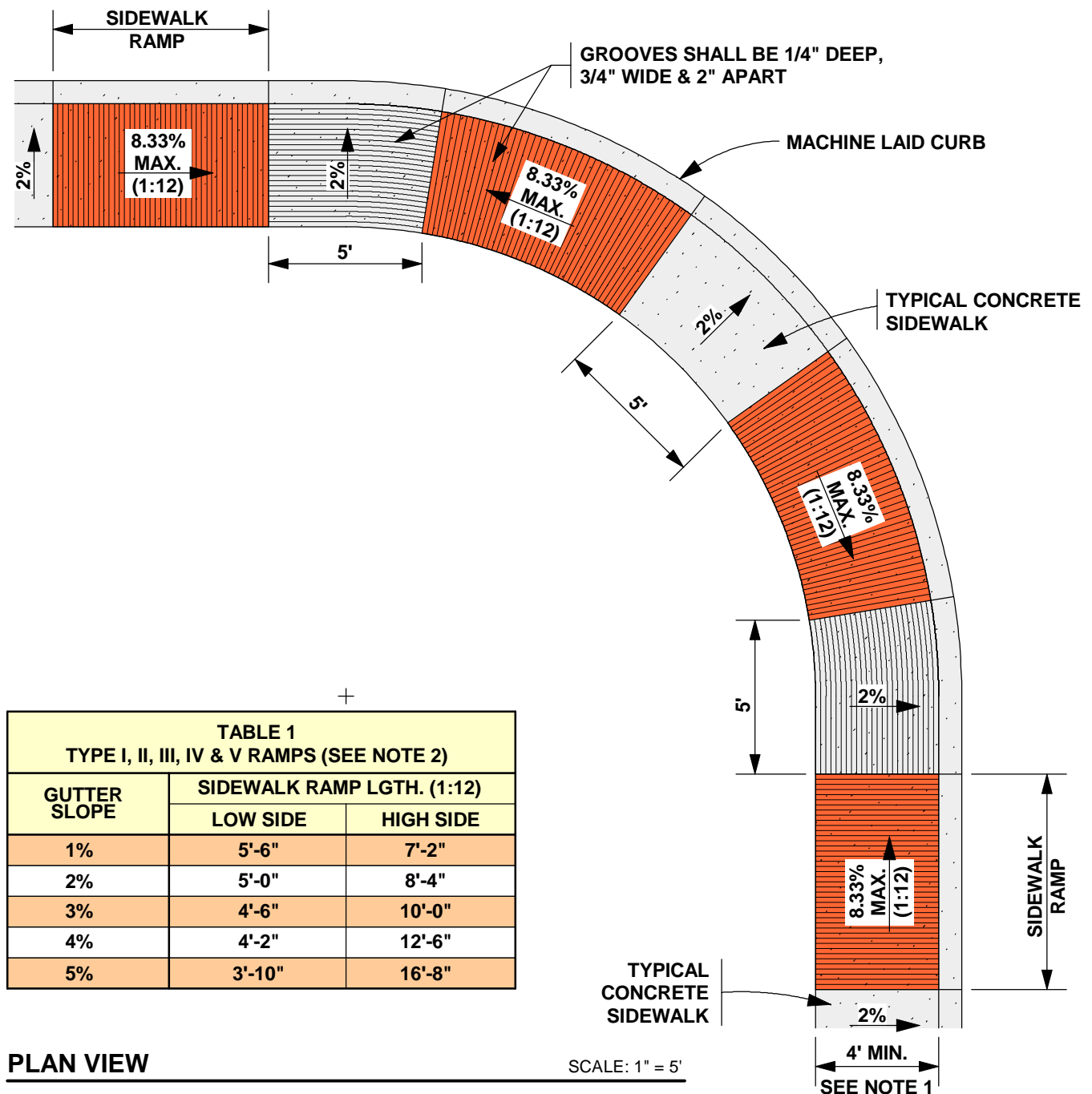
SIDEWALK DRAIN

WITH SIDEWALK SEPARATED FROM CURB

SIDEWALKS AND WHEELCHAIR RAMPS GENERAL NOTES

1. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
2. SIDEWALK RAMP LENGTHS PRESENTED IN TABLE 1 ARE GUIDELINES ONLY. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE.
3. ALL RAMPS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
4. SIDEWALK RAMP TYPE V SHALL BE USED ONLY WHERE THERE IS SIGNIFICANT RESTRICTION WITHIN THE PARKWAY TO CONSTRUCT TYPE I OR TYPE III RAMPS.
5. CONSTRUCTION OF ALL WHEELCHAIR RAMPS TO BE INCLUDED UNDER ITEMS "500 - CONCRETE CURBING", "501 - MACHINE LAID CURB" AND/OR "502 - CONCRETE SIDEWALKS". RAMP SURFACE SHALL BE BRUSH FINISHED AND GROOVED.
6. THESE DETAILS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS OF WHEELCHAIR RAMPS TO BE SHOWN ON CONSTRUCTION PLANS. CITY CONSTRUCTION INSPECTOR CAN ADJUST LOCATIONS FOR SAFETY OR UTILITY CLEARANCE.
7. SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM SPACING OF 200 FEET. SEE DRAWING C13 FOR DETAIL.
8. WHEELCHAIR RAMP SHALL BE CONSTRUCTED WITH 4" CLASS "A" CONCRETE AND 2" GRAVEL, CRUSHED ROCK OR FLEXIBLE BASE MATERIAL.
9. REINFORCING STEEL SHALL BE #3 BARS AT 18" O.C. EACH WAY OR 6" x 6" - W2.9 x W2.9.
10. WHEELCHAIR AND SIDEWALK RAMP GROOVES SHALL BE 1 / 4" DEEP, 3 / 4" WIDE AND 2" APART.

WHEELCHAIR RAMP GENERAL NOTES



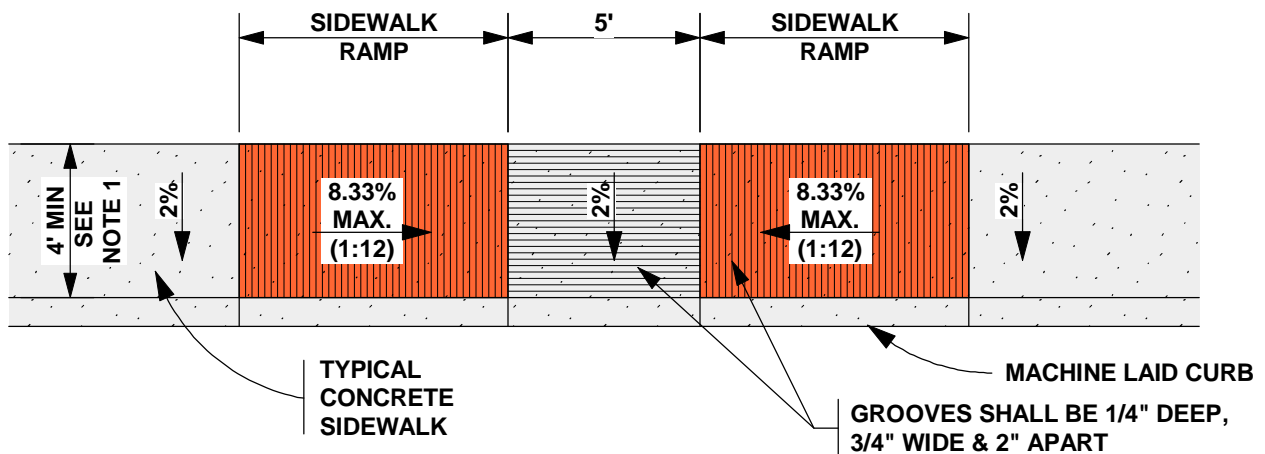
SIDEWALKS AND WHEELCHAIR RAMPS GENERAL NOTES

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3. ALL RAMPS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.

WHEELCHAIR RAMP DETAIL TYPE I

WITH SIDEWALK ABUTTING CURB

TABLE 1 TYPE I, II, III, IV & V RAMPS (SEE NOTE 2)		
GUTTER SLOPE	SIDEWALK RAMP LGTH. (1:12)	
	LOW SIDE	HIGH SIDE
1%	5'-6"	7'-2"
2%	5'-0"	8'-4"
3%	4'-6"	10'-0"
4%	4'-2"	12'-6"
5%	3'-10"	16'-8"

**PLAN VIEW**

SCALE: 1" = 5'

SIDEWALKS AND WHEELCHAIR RAMPS GENERAL NOTES

1. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
2. SIDEWALK RAMP LENGTHS PRESENTED IN TABLE 1 ARE GUIDELINES ONLY. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE.
3. ALL RAMPS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.

WHEELCHAIR RAMP DETAIL TYPE II

WITH SIDEWALK ABUTTING CURB

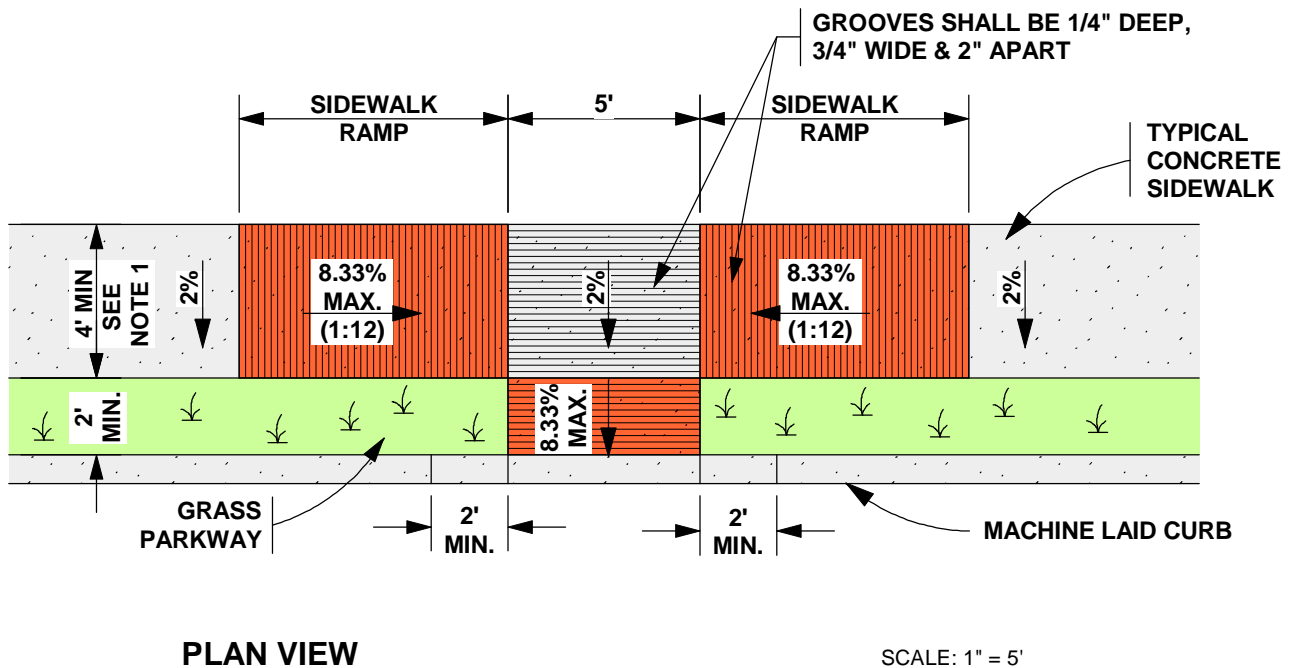


SCALE: 1" = 5'

1. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
2. SIDEWALK RAMP LENGTHS PRESENTED IN TABLE 1 ARE GUIDELINES ONLY. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE.
3. ALL RAMPS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.

WITH SIDEWALK SEPARATED FROM CURB

TABLE 1 TYPE I, II, III, IV & V RAMPS (SEE NOTE 2)		
GUTTER SLOPE	SIDEWALK RAMP LGTH. (1:12)	
	LOW SIDE	HIGH SIDE
1%	5'-6"	7'-2"
2%	5'-0"	8'-4"
3%	4'-6"	10'-0"
4%	4'-2"	12'-6"
5%	3'-10"	16'-8"

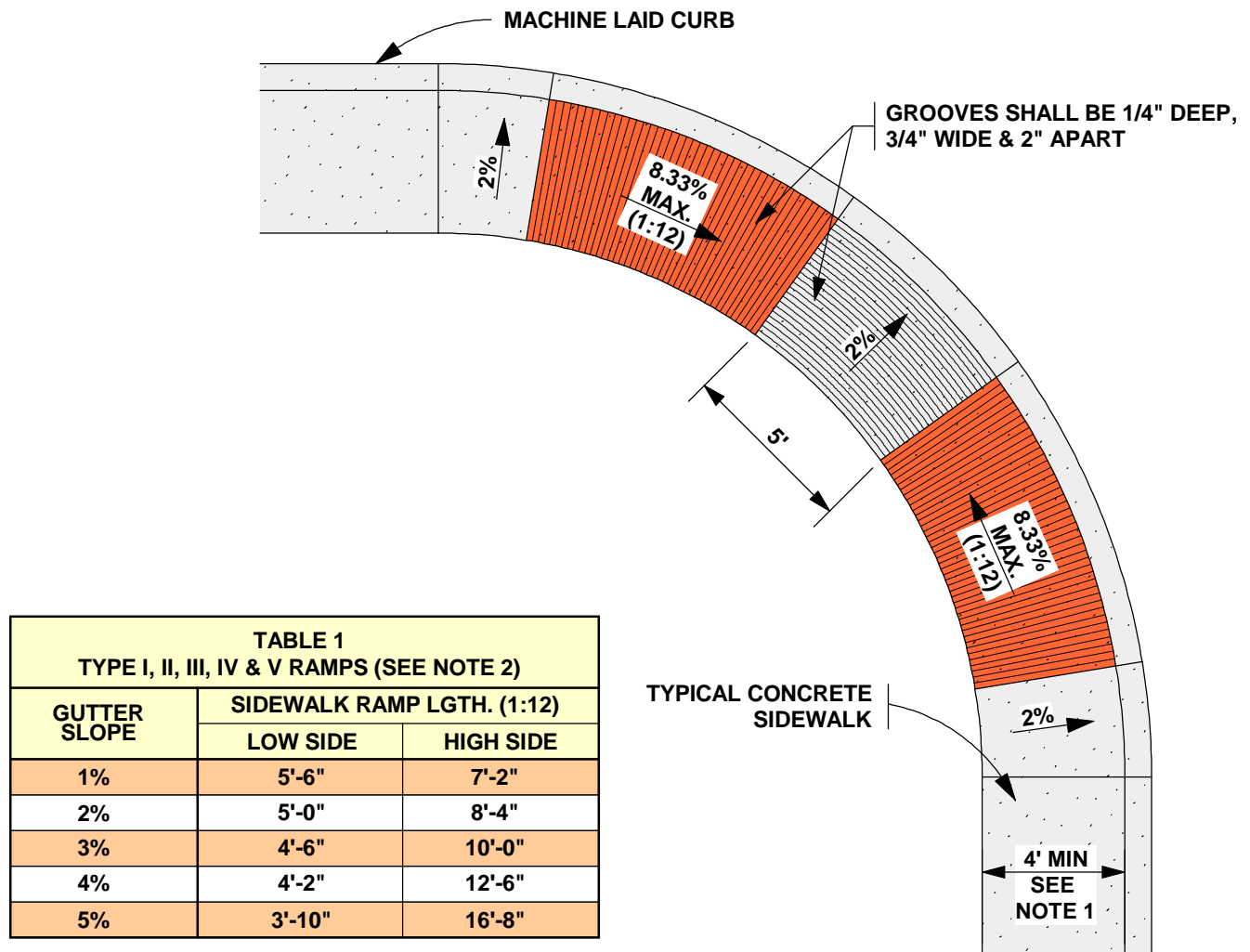


SIDEWALKS AND WHEELCHAIR RAMPS GENERAL NOTES

1. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
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3. ALL RAMPS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.

WHEELCHAIR RAMP DETAIL TYPE IV

WITH SIDEWALK SEPARATED FROM CURB

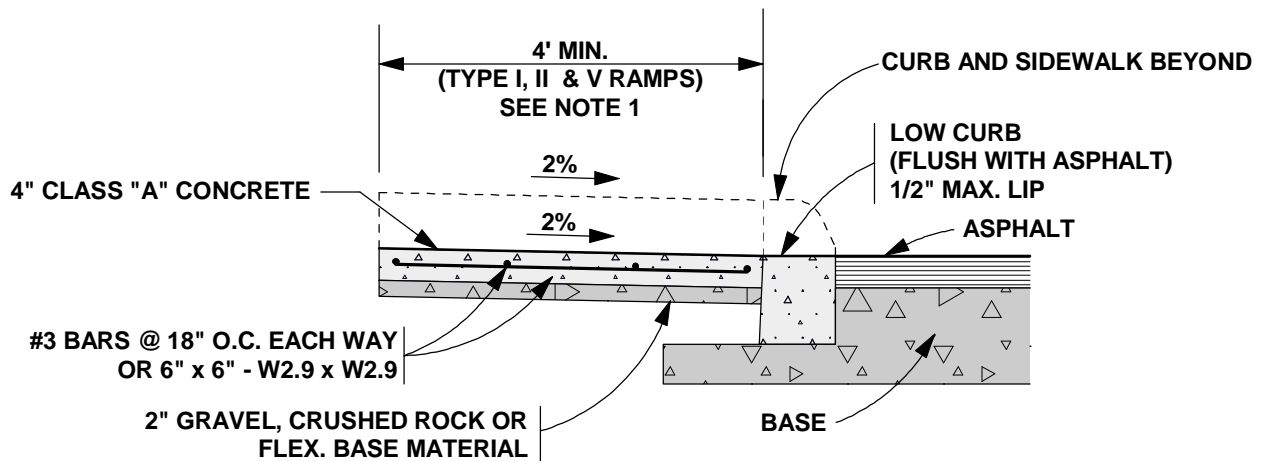


SIDEWALKS AND WHEELCHAIR RAMPS GENERAL NOTES

1. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
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3. ALL RAMPS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
4. SIDEWALK RAMP TYPE V SHALL BE USED ONLY WHERE THERE IS SIGNIFICANT RESTRICTION WITHIN THE PARKWAY TO CONSTRUCT TYPE I OR TYPE III RAMPS.

WHEELCHAIR RAMP DETAIL TYPE V

WITH SIDEWALK ABUTTING CURB

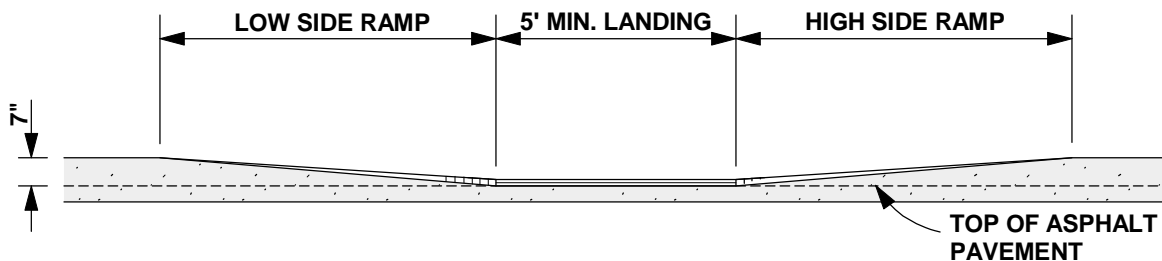
**SECTION**

SCALE: 1" = 2'

SIDEWALKS AND WHEELCHAIR RAMPS GENERAL NOTES

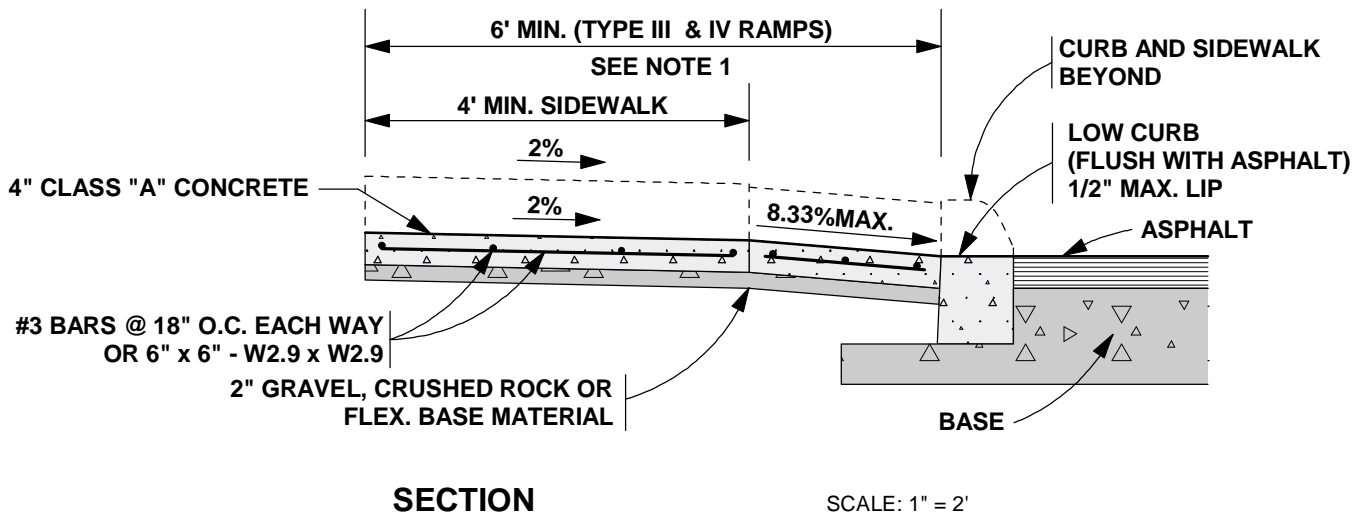
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TABLE 1 TYPE I, II, III, IV & V RAMPS (SEE NOTE 2)		
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	LOW SIDE	HIGH SIDE
1%	5'-6"	7'-2"
2%	5'-0"	8'-4"
3%	4'-6"	10'-0"
4%	4'-2"	12'-6"
5%	3'-10"	16'-8"

**CURB PROFILE**

SCALE: 1" = 4'

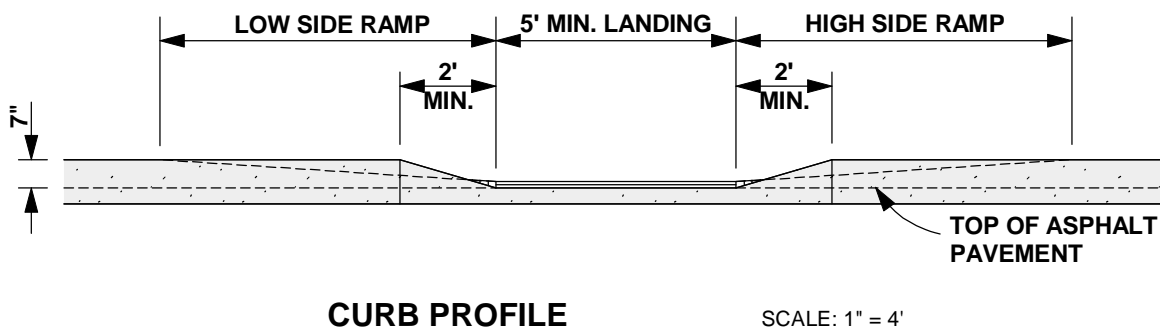
WHEELCHAIR RAMP SECTION AND CURB PROFILE



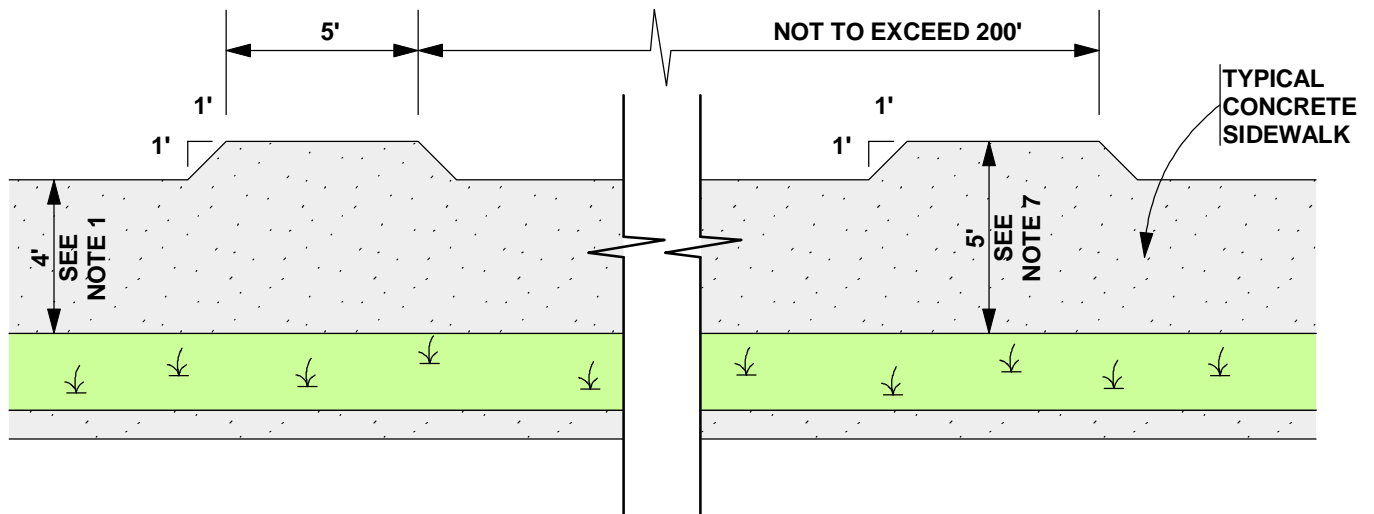
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5%	3'-10"	16'-8"



WHEELCHAIR RAMP SECTION AND CURB PROFILE

**PLAN VIEW**

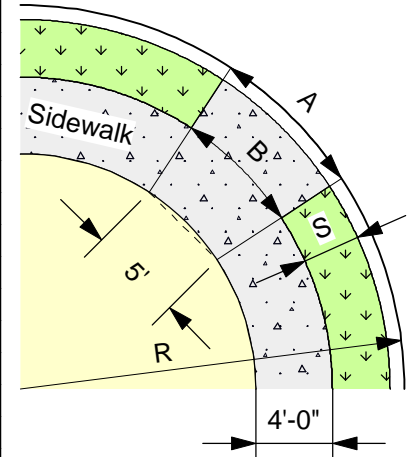
SCALE: 1" = 5'

SIDEWALKS AND WHEELCHAIR RAMPS GENERAL NOTES

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7. SIDEWALK LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM SPACING OF 200 FEET.

SIDEWALK PASSING SPACE

R		Sidewalk setback from curb (S)				
		0'	2'	3'	4'	5'
15'	A	7' 4-3/4"	9' 2-7/8"	10' 6-3/4"	12' 4-1/8"	14' 10-5/8"
	B		7' 6-1/2"	7' 11"	8' 5-1/4"	9' 2-1/8"
16'	A	7' 2"	8' 9-1/8"	9' 10-1/4"	11' 3-1/4"	13' 2"
	B		7' 3"	7' 6-1/2"	7' 11"	8' 5-1/4"
17'	A	6' 11-7/8"	8' 4-1/2"	9' 3-5/8"	10' 5-5/8"	11' 11-5/8"
	B		7' 0-1/4"	7' 3"	7' 6-1/2"	7' 11"
18'	A	6' 10"	8' 0-3/4"	8' 10-1/2"	9' 10-1/4"	11' 1"
	B		6' 10"	7' 0-1/4"	7' 3"	7' 6-1/2"
19'	A	6' 8-3/8"	7' 9-3/4"	8' 6-1/8"	9' 4-3/8"	10' 4-3/4"
	B		6' 8-1/8"	6' 10"	7' 0-1/4"	7' 3"
20'	A	6' 7"	7' 7-1/8"	8' 2-5/8"	8' 11-5/8"	9' 10-1/4"
	B		6' 6-5/8"	6' 8-1/8"	6' 10"	7' 0-1/4"
21'	A	6' 5-7/8"	7' 4-7/8"	7' 11-5/8"	8' 7-5/8"	9' 5"
	B		6' 5-1/4"	6' 6-5/8"	6' 8-1/8"	6' 10"
22'	A	6' 4-3/4"	7' 3"	7' 9-1/8"	8' 4-1/4"	9' 0-1/2"
	B		6' 4-1/8"	6' 5-1/4"	6' 6-5/8"	6' 8-1/8"
23'	A	6' 3-7/8"	7' 1-1/4"	7' 6-7/8"	8' 1-3/8"	8' 8-3/4"
	B		6' 3-1/8"	6' 4-1/8"	6' 5-1/4"	6' 6-5/8"
24'	A	6' 3"	6' 11-3/4"	7' 5"	7' 10-7/8"	8' 5-5/8"
	B		6' 2-1/8"	6' 3-1/8"	6' 4-1/8"	6' 5-1/4"
25'	A	6' 2-1/4"	6' 10-1/2"	7' 3-1/4"	7' 8-5/8"	8' 2-3/4"
	B		6' 1-3/8"	6' 2-1/8"	6' 3-1/8"	6' 4-1/8"
26'	A	6' 1-5/8"	6' 9-1/4"	7' 1-3/4"	7' 6-3/4"	8' 0-3/8"
	B		6' 0-5/8"	6' 1-3/8"	6' 2-1/8"	6' 3-1/8"
27'	A	6' 1"	6' 8-1/4"	7' 0-3/8"	7' 5"	7' 10-1/4"
	B		6' 0"	6' 0-5/8"	6' 1-3/8"	6' 2-1/8"
28'	A	6' 0-3/8"	6' 7-1/4"	6' 11-1/8"	7' 3-1/2"	7' 8-3/8"
	B		5' 11-1/2"	6' 0"	6' 0-5/8"	6' 1-3/8"
29'	A	5' 11-7/8"	6' 6-3/8"	6' 10-1/8"	7' 2-1/8"	7' 6-5/8"
	B		5' 10-7/8"	5' 11-1/2"	6' 0"	6' 0-5/8"
30'	A	5' 11-3/8"	6' 5-5/8"	6' 9-1/8"	7' 0-7/8"	7' 5-1/8"
	B		5' 10-1/2"	5' 10-7/8"	5' 11-1/2"	6' 0"
31'	A	5' 11"	6' 4-7/8"	6' 8-1/8"	6' 11-3/4"	7' 3-3/4"
	B		5' 10"	5' 10-1/2"	5' 10-7/8"	5' 11-1/2"
32'	A	5' 10-1/2"	6' 4-1/8"	6' 7-3/8"	6' 10-3/4"	7' 2-1/2"
	B		5' 9-5/8"	5' 10"	5' 10-1/2"	5' 10-7/8"
33'	A	5' 10-1/8"	6' 3-1/2"	6' 6-1/2"	6' 9-3/4"	7' 1-3/8"
	B		5' 9-1/4"	5' 9-5/8"	5' 10"	5' 10-1/2"
34'	A	5' 9-7/8"	6' 3"	6' 5-7/8"	6' 8-7/8"	7' 0-1/4"
	B		5' 8-7/8"	5' 9-1/4"	5' 9-5/8"	5' 10"
35'	A	5' 9-1/2"	6' 2-3/8"	6' 5-1/8"	6' 8-1/8"	6' 11-1/4"
	B		5' 8-5/8"	5' 8-7/8"	5' 9-1/4"	5' 9-5/8"
36'	A	5' 9-1/4"	6' 1-7/8"	6' 4-1/2"	6' 7-3/8"	6' 10-3/8"
	B		5' 8-1/4"	5' 8-5/8"	5' 8-7/8"	5' 9-1/4"
37'	A	5' 8-7/8"	6' 1-1/2"	6' 4"	6' 6-5/8"	6' 9-5/8"
	B		5' 8"	5' 8-1/4"	5' 8-5/8"	5' 8-7/8"
38'	A	5' 8-5/8"	6' 1"	6' 3-1/2"	6' 6"	6' 8-7/8"
	B		5' 7-3/4"	5' 8"	5' 8-1/4"	5' 8-5/8"
39'	A	5' 8-3/8"	6' 0-5/8"	6' 3"	6' 5-1/2"	6' 8-1/8"
	B		5' 7-1/2"	5' 7-3/4"	5' 8"	5' 8-1/4"
40'	A	5' 8-1/8"	6' 0-1/4"	6' 2-1/2"	6' 4-7/8"	6' 7-3/8"
	B		5' 7-1/4"	5' 7-1/2"	5' 7-3/4"	5' 8"



CURB AND SIDEWALK ARC LENGTH TABLE

CONCRETE DRIVEWAY GENERAL NOTES

1. DRIVEWAY PENETRATION REFERS TO A PORTION OF THE DRIVEWAY THAT MAY BE NECESSARY TO RECONSTRUCT WITHIN PRIVATE PROPERTY TO COMPLY WITH A MAXIMUM DRIVEWAY SLOPE. THIS PORTION OF THE DRIVEWAY SHALL BE PAID FOR UNDER THE FOLLOWING ITEMS AS MAY APPLY:

A) CONCRETE DRIVEWAY PAID FOR UNDER ITEM NO. 502-2

B) ASPHALTIC CONCRETE DRIVEWAY PAID FOR UNDER ITEM NO. 503-1 1" ASPHALT TYPE 'D' & 6" FLEXIBLE BASE

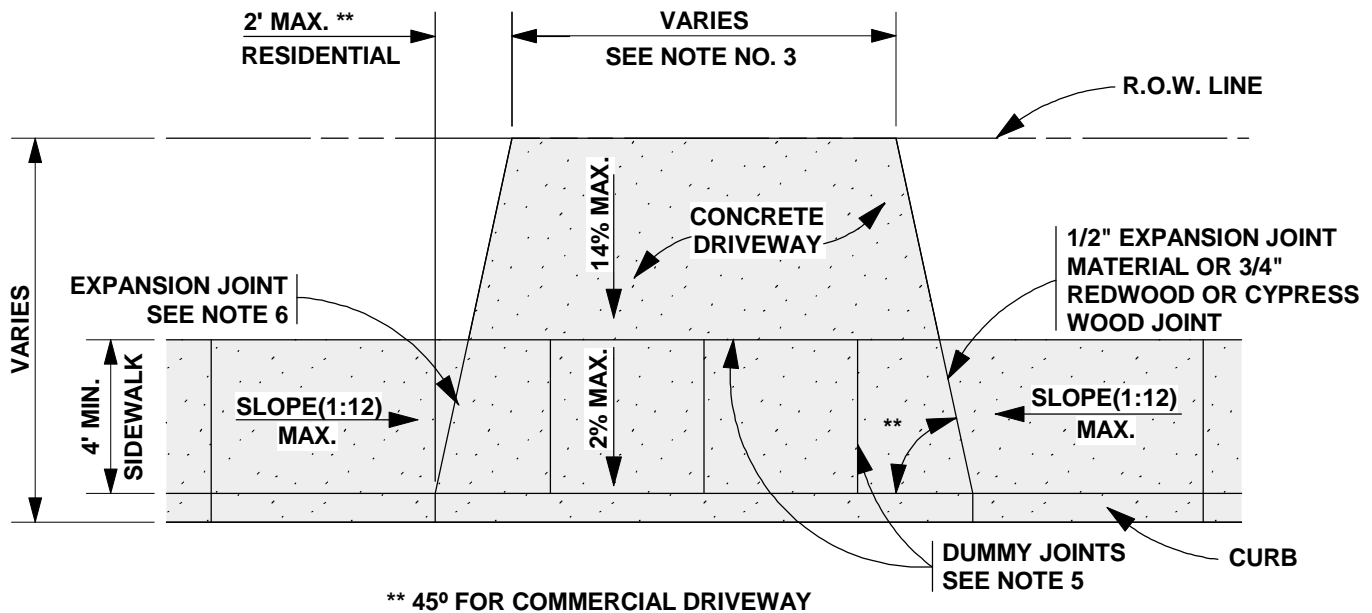
C) GRAVEL DRIVEWAY PAID FOR UNDER ITEM NO. 503-2 AND SHALL INCLUDE A MINIMUM OF 6" FLEXIBLE BASE

2. 7" MINIMUM HEIGHT WILL NOT NECESSARILY OCCUR AT THE PROPERTY LINE. IT MAY OCCUR WITHIN THE RIGHT OF WAY OR WITHIN THE DRIVEWAY PENETRATION ON PRIVATE PROPERTY.
3. THE PROPOSED DRIVEWAY SHOULD MATCH THE EXISTING WIDTH AT THE PROPERTY LINE BUT UNLESS AUTHORIZED BY THE CITY TRAFFIC ENGINEER, THE WIDTH SHALL BE WITHIN THE FOLLOWING VALUES:

TYPE	MINIMUM	MAXIMUM
RESIDENTIAL	10'	20'
COMMERCIAL - ONE WAY	12'	20'
COMMERCIAL - TWO WAY	24'	30'

4. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
5. DUMMY JOINTS PARALLEL TO THE CURB SHALL BE PLACED WHERE THE SIDEWALK MEETS THE DRIVEWAY. DUMMY JOINTS PERPENDICULAR TO THE CURB, AND WITHIN THE BOUNDARIES OF THE PARALLEL DUMMY JOINTS, SHALL BE PLACED AT INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK.
6. A MINIMUM OF TWO ROUND AND SMOOTH DOWEL BARS 3/8" IN DIAMETER AND 18" IN LENGTH SHALL BE SPACED 18" APART AT EACH EXPANSION JOINT.
7. WHERE SIDEWALKS CROSS DRIVEWAYS, THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2%.

CONCRETE DRIVEWAY GENERAL NOTES



CONCRETE DRIVEWAY GENERAL NOTES

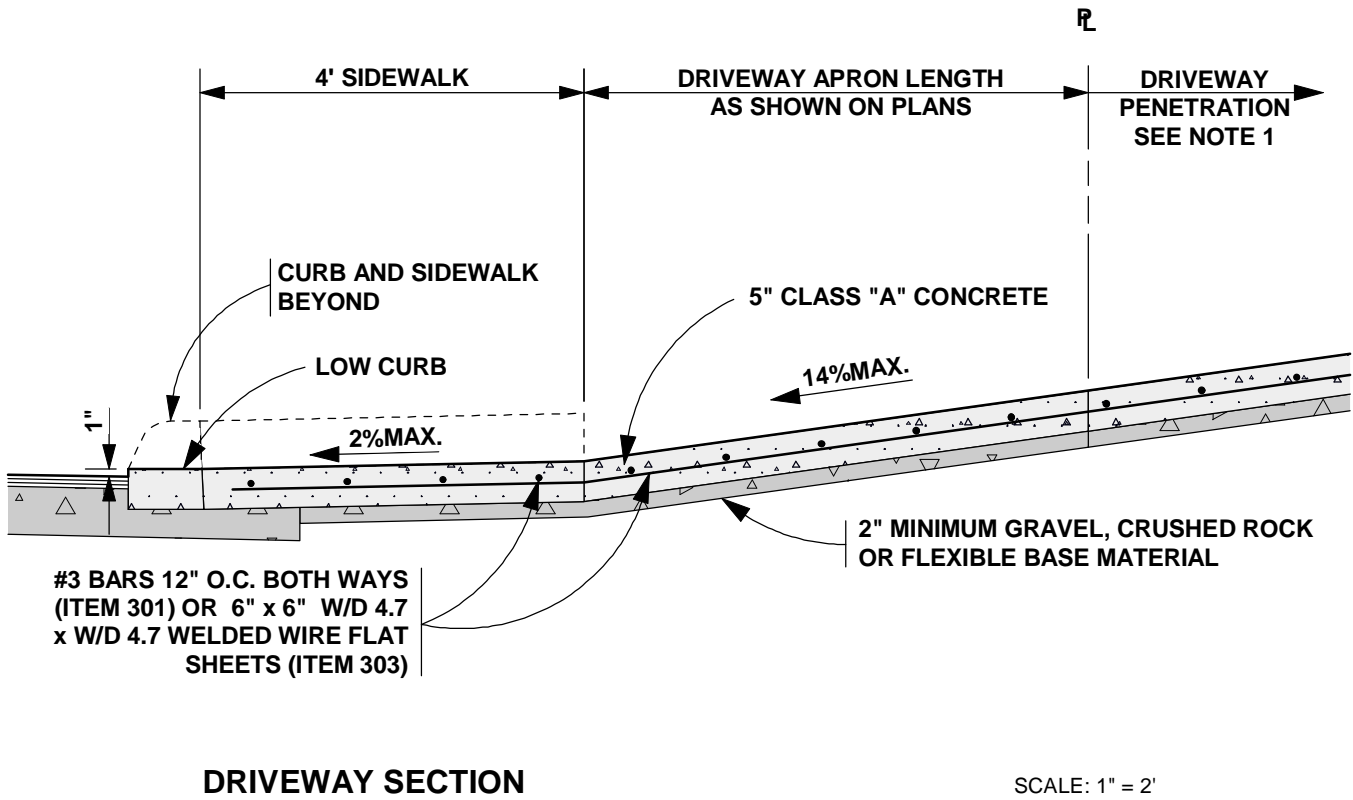
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CONCRETE DRIVEWAY PLAN VIEW

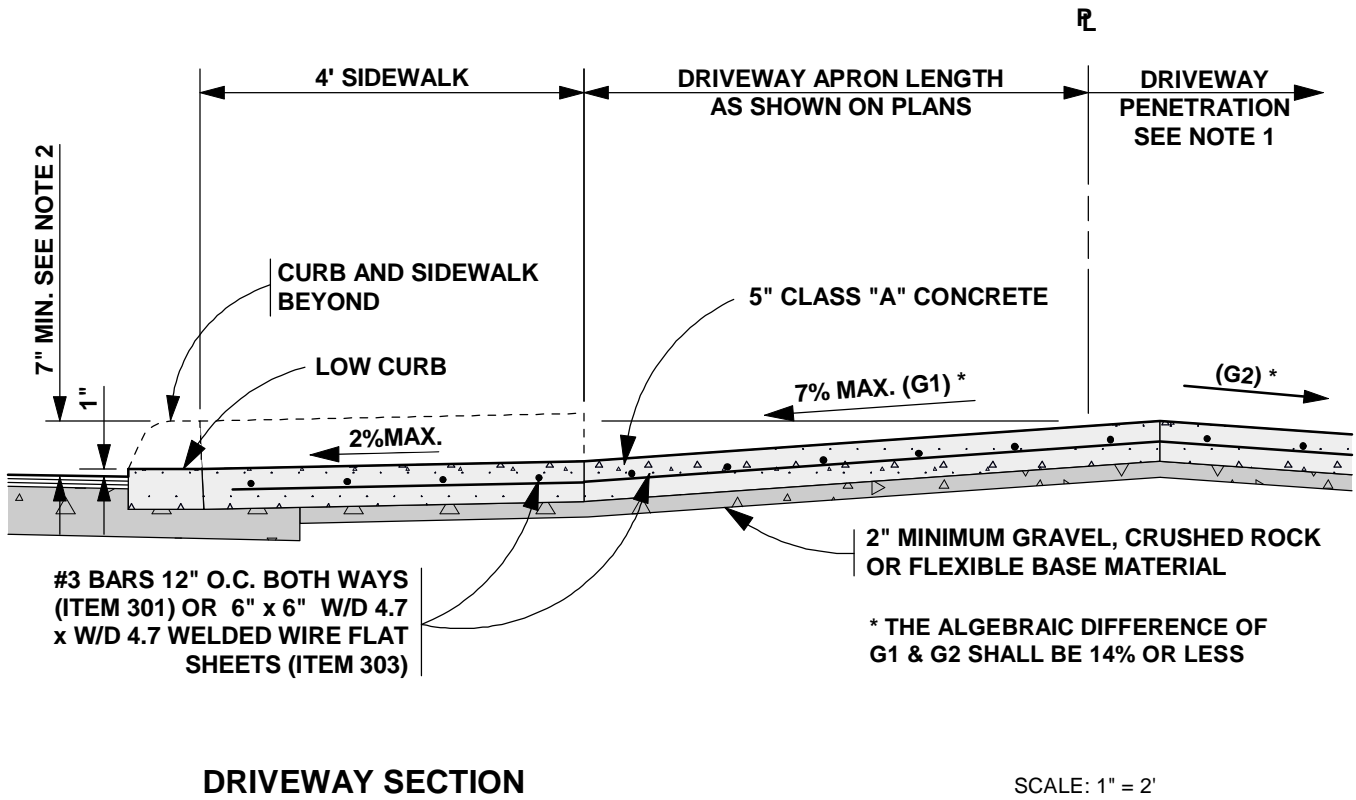
WITH SIDEWALK ABUTTING CURB



CONCRETE DRIVEWAY GENERAL NOTES

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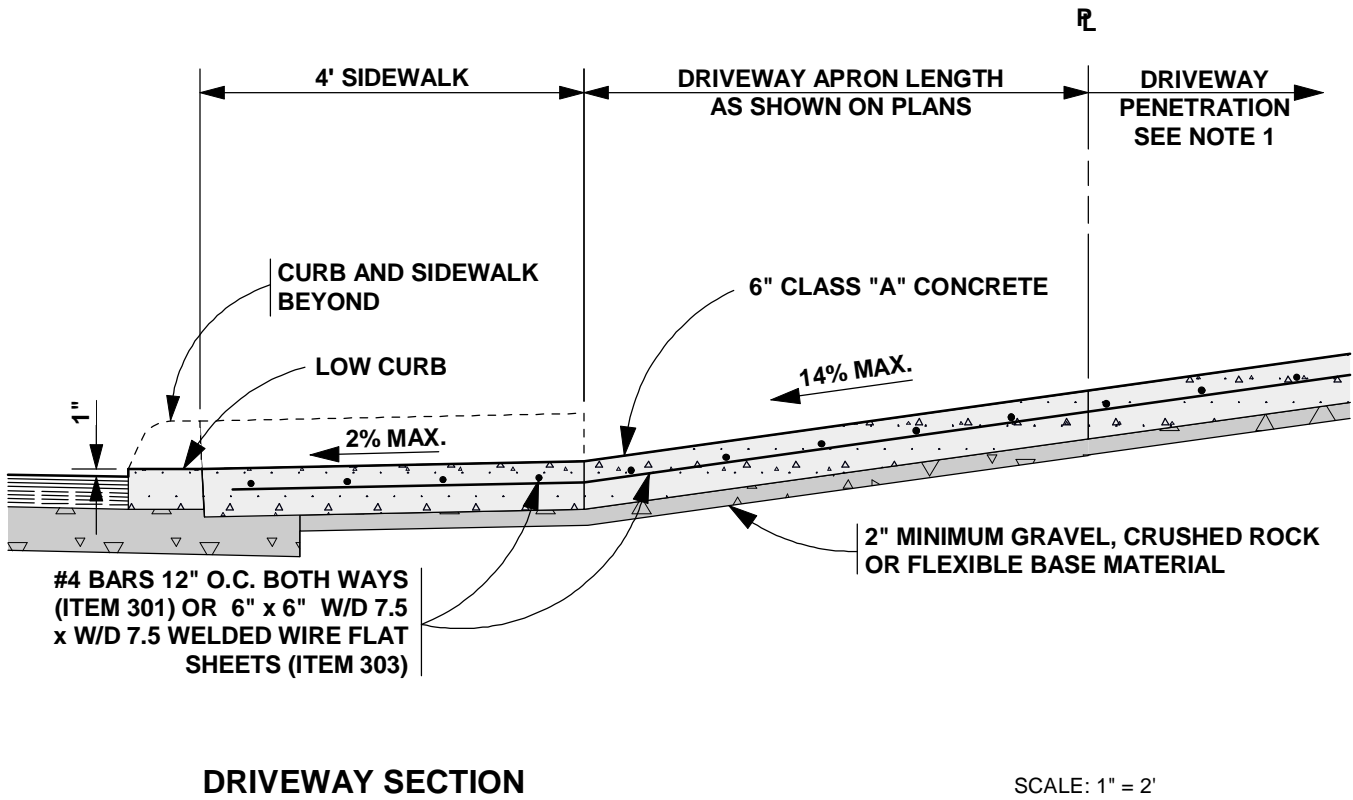
RESIDENTIAL DRIVEWAY SECTION



CONCRETE DRIVEWAY GENERAL NOTES

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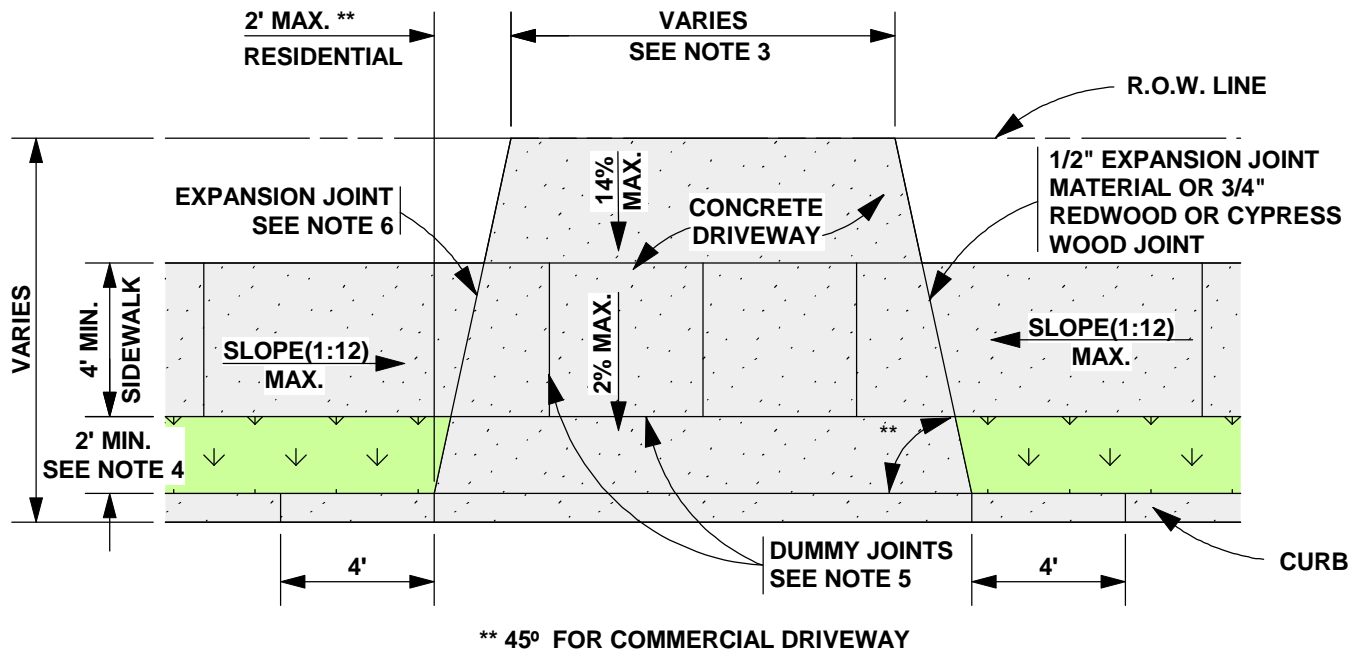
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COMMERCIAL DRIVEWAY SECTION

**PLAN VIEW**

SCALE: 1" = 5'

CONCRETE DRIVEWAY GENERAL NOTES

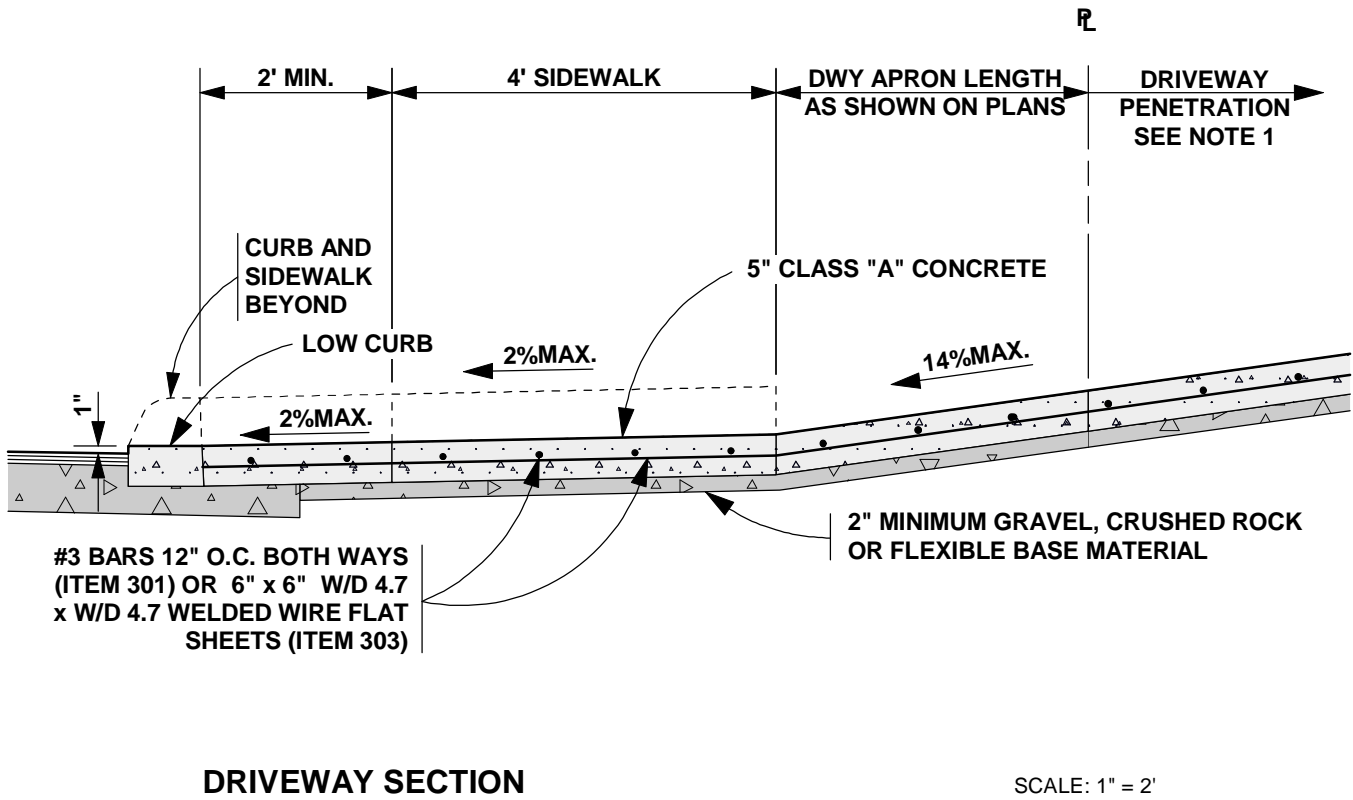
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CONCRETE DRIVEWAY PLAN VIEW

WITH SIDEWALK SEPARATED FROM CURB

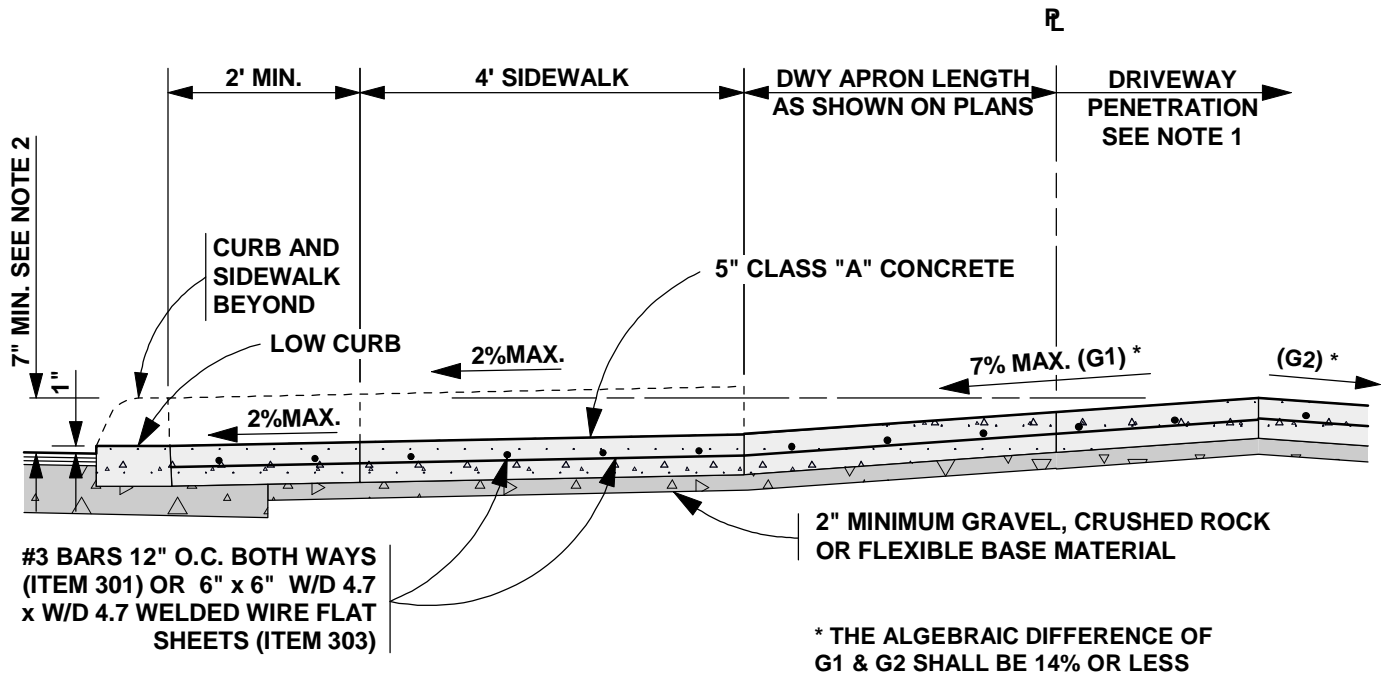


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RESIDENTIAL DRIVEWAY SECTION

WITH SIDEWALK SEPARATED FROM CURB

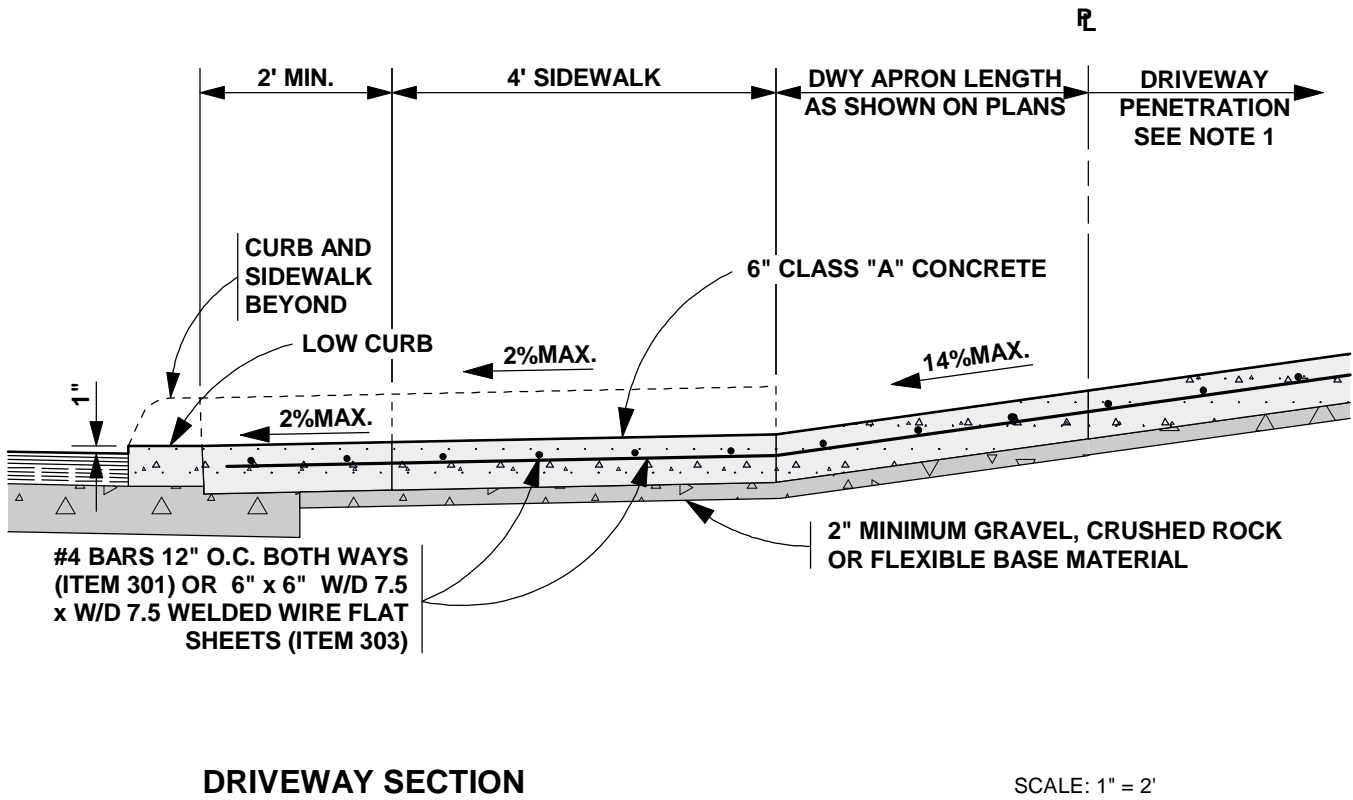
**DRIVEWAY SECTION**

SCALE: 1" = 2'

CONCRETE DRIVEWAY GENERAL NOTES

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RESIDENTIAL DRIVEWAY SECTION

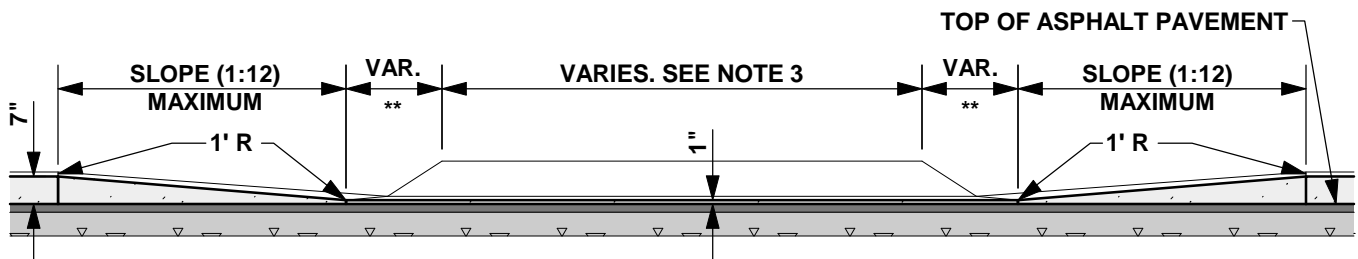


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COMMERCIAL DRIVEWAY SECTION

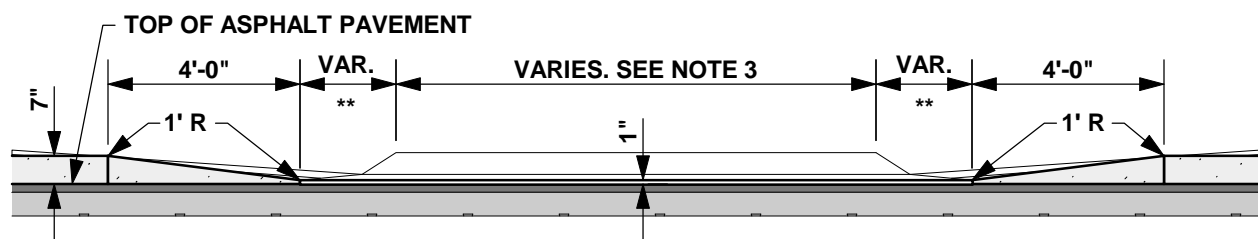
WITH SIDEWALK SEPARATED FROM CURB



DRIVEWAY CURB PROFILE
WITH SIDEWALK ABUTTING THE CURB

SCALE: 1" = 4'

** RESIDENTIAL : 2' MAXIMUM;
COMMERCIAL: SEE PLAN VIEW



DRIVEWAY CURB PROFILE
WITH SIDEWALK SEPARATED FROM CURB

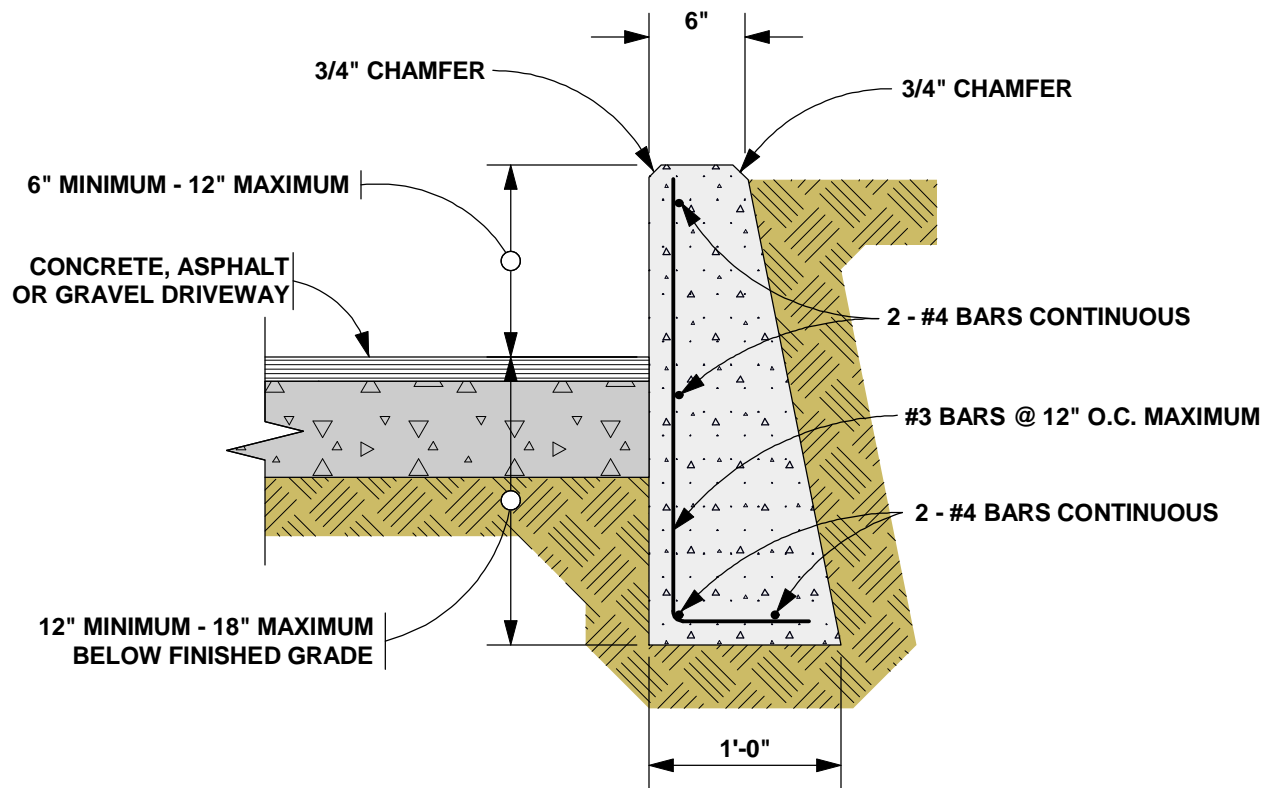
SCALE: 1" = 4'

CONCRETE DRIVEWAY GENERAL NOTES

3. THE PROPOSED DRIVEWAY SHOULD MATCH THE EXISTING WIDTH AT THE PROPERTY LINE BUT UNLESS AUTHORIZED BY THE CITY TRAFFIC ENGINEER, THE WIDTH SHALL BE WITHIN THE FOLLOWING VALUES:

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CONCRETE DRIVEWAY CURB PROFILE



NOTE:
 COST OF REINFORCEMENT TO BE INCLUDED
 IN UNIT COST OF CONCRETE

RETAINING WALL SECTION

SCALE: 1" = 1'

DRIVEWAY CONCRETE RETAINING WALL

ITEM 300-1 ON COMPACTED SUBGRADE